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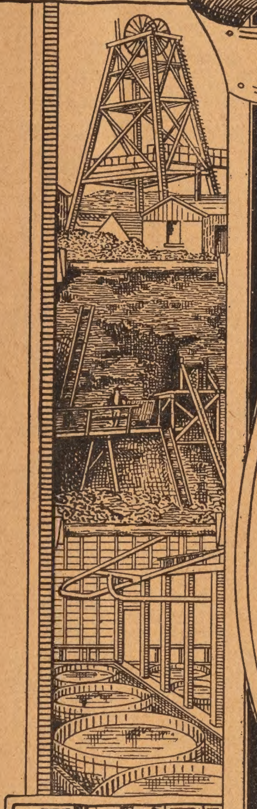
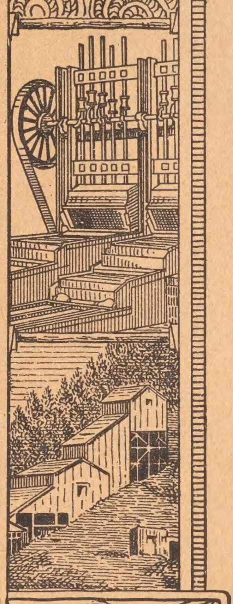
THE NEW ZEALAND MINES RECORD

PRICE
ONE SHILLING

Vol. 1. WELLINGTON, N.Z., FEBRUARY 16, 1898. No. 7.

Issued by the Mining
Bureau of the New Zealand
Mines Department, under the direction of the
HON. A. J. CADMAN, MINISTER OF MINES.





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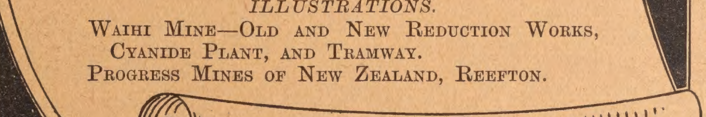
C.H. PIERARD. DEL.



WELLINGTON:
JOHN MACKAY, GOVERNMENT PRINTER.

THE

New Zealand Mines Record.

VOL. I. FEBRUARY 16, 1898. No. 7.

NOTES FROM THE MINES.

HAURAKI GOLDFIELDS.

Thames.

Moanataiari.—A trial was made of the new battery at the commencement of this month, and the start was regarded as satisfactory in every way. The ore reaches the mill from the mine by means of the main adit tunnel, with which all parts of the mine are connected. It is dumped on to two large grizzlies, the finer ore falling into an ore-bin underneath, and the coarser passing through the rock-breaking machines, whence the crushed material finds its way into the same ore-bin. The ore is then lifted by a double-cylinder hydraulic elevator, with two cages, to the storage-bins above the stamps, each of the bins being capable of holding 200 tons. From these bins the ore passes automatically to the self-feeders, and thence to the stamps. The crushed pulp passes over amalgamated Muntz-metal plates $\frac{1}{8}$ in. thick, 10 ft. long, and the full width of the mortar-box. From the bottom of the tables the pulp passes on to the vanners, of which there are two for each battery of five stamps. The vanner concentrates are collected in a small truck running on a line of rails passing through both sections of the mill to the cyanide building, where they are elevated by a single-cylinder hydraulic lift to the leaching-vats. The vanner tailings or sands are conducted in launders to the Cornish buddles situated at the north end of the buildings, the proposal being to treat the buddle concentrates in the berdans (which formed a part of the old mill). The plant comprises a 60-head battery, two rock-breakers, grizzlies, automatic feeders, twenty-four vanners, twenty-one berdans, a complete cyanide plant for the treatment of the vanner concentrates, nine Cornish buddles for concentrating the tailings from the vanners, with up-to-date appliances for assaying and retorting. The mill, which is built on the most modern American principle, with all the latest improvements for handling and treating ore at a minimum of cost, is centrally situated, and easily accessible to the mine. The machinery is so arranged that it can be driven either by steam- or water-power, as may be required. There are nine Pelton water-wheels to drive the machinery, distributed as follows:—

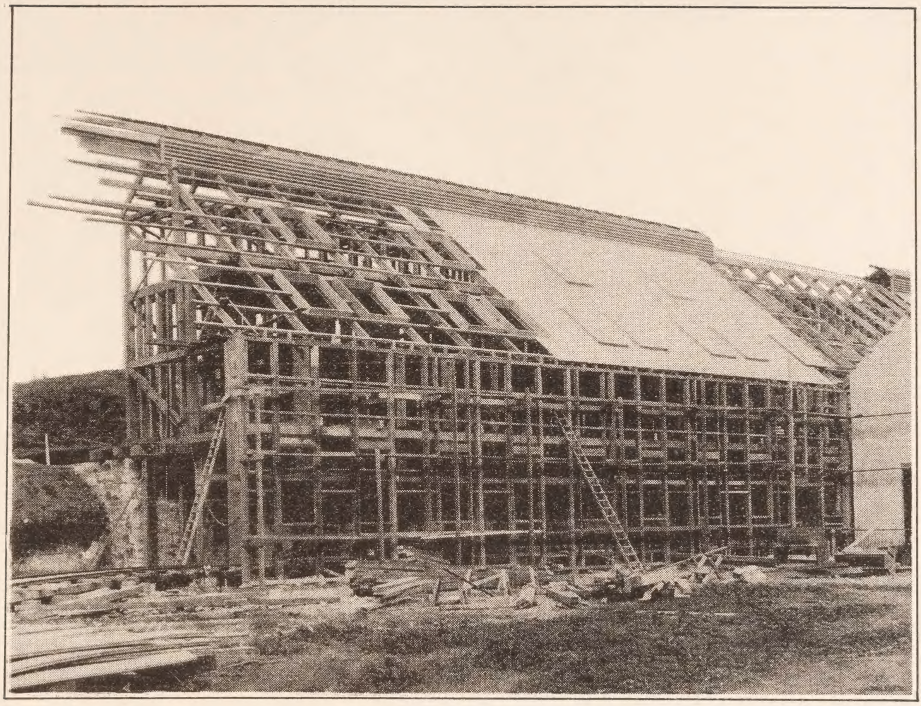
Stamps	Two 6 ft. Peltons.
Rock-breakers	One 6 ft. "
Vanners	Two 3 ft. "
Berdans	Two 3 ft. "
Dynamo for electric lighting ..	One 4 ft. "
Vaccuum and air-pumps of cyanide plant, and specimen stamper ..	One 3 ft. "

Water is obtained from the county 30 in. main by means of two 20 in. branch mains. In the event of scarcity of water, the whole of the machinery can be worked by a powerful right-hand tandem compound-condensing horizontal engine, with a high-pressure cylinder $17\frac{1}{2}$ in. in diameter, and a low-pressure cylinder 20 in. in diameter, provided with automatic expansion gear, special governor and jet-condenser, and air-pump with indiarubber valves. The engine, which has a stroke of 2 ft. 8 in., runs at a speed of seventy-five revolutions per minute, and is capable of developing about 240 indicated horse-power. It is placed between the north and south wings of the battery, connection with the driving-shaft of the stamps being effected by an intermediate shaft 6 in. in diameter. There are two Babcock and Wilcox patent water-tube boilers, capable of working up to a pressure of 120 lb. per square inch. The mill is divided into two sections, each having 30 stamps, with due proportion of vanners, berdans, &c. These can be run together or separately, and, as each set of five heads is driven from a separate cam-shaft, any required number can be hung up without interfering with the general efficiency of the mill. The rock-breakers are of the Blake-Marsden type, with 16 in. by 10 in. face, capable of crushing sufficient ore in 8 hours to keep the complete mill going during 24 hours. The stamps, weighing 1,050 lb. each, run at a speed of ninety-five drops per minute, and when driven to their full capacity are capable of crushing 4 tons of ore per stamp a day, or 240 tons per day in the aggregate. The shanks are of mild steel, 15 ft. in length and 3½ in. in diameter, fitted with reversible steel tappets, and held to the stem with three side-cutter keys; while the shoes and dies are made of hard cast-steel. There are twelve mortar-boxes of the Homestake type, fitted with inside copper-plates placed below the feed-apron, the screen-openings of each box being 4 ft. long and 18 in. high. The base of each mortar is 5 ft. 3 in. in length and 2 ft. in width, the metal in the bottom being 9 in. in thickness. Each mortar-box weighs about 2½ tons. The foundations are of a massive and substantial character. The mortar-blocks, which are heart of kauri, are 5 ft. 6 in. by 2 ft. 3 in., and 18 ft. in length, each resting on a ground-sill embedded in a thick layer of concrete, on a solid foundation in the north section, and upon sheet piling in the south section. The upper ends of the amalgamating-tables are fixed on cast-iron cradles, so that the angle of inclination can be altered as required. The concentrating plant consists of twelve Frue and twelve Union vanners, placed head to head, each set of five stamps having two vanners. There are twenty-one berdans, divided between the north and south sections of the mill, and erected at the western side of the vanners. The cyanide plant consists of three large steel cyanide-vats, each being 20 ft. in diameter and 7 ft. in depth, provided with two of Butler's bottom-discharge doors, and each capable of holding a charge of 200 tons of concentrates; two zinc-extractors, each 15 ft. 6 in. in length; and three large concrete sumps, 50 ft. by 11 ft. by 6 ft. over all. The plant also comprises the necessary vacuum cylinder and storage-vat, dissolving-vat, air- and solution-pumps, and all the necessary pipes, launders, filter-presses, and appliances that are required in a well-equipped cyanide plant. The retorting-room contains two retorting-furnaces, one smelting-furnace, and an oxidizing-furnace, and the assay department is also supplied with the usual melting- and muffling-furnaces, balances, and a stock of chemicals. Messrs. A. and G. Price, of the Thames, who were intrusted with the carrying-out of the plans of the company's engineers, Messrs. Henry A. Gordon and James Park, had a large staff of men employed on the works for a period of nearly twelve months. The erection of the engine and boilers was carried out by Mr. J. Welman; while the buildings were erected under the supervision of the manager, Mr. G. S. Clark, by the company's workmen. The whole of the mill and dump adjoining is lit by electricity, the installation having been erected by Mr. Fenn, of Messrs. Chambers Brothers, Auckland. The dynamo is of 250 volts, and capable of lighting 120 lamps of 15-candle power. All these important works have been carried out to the satisfaction of the company's engineers.

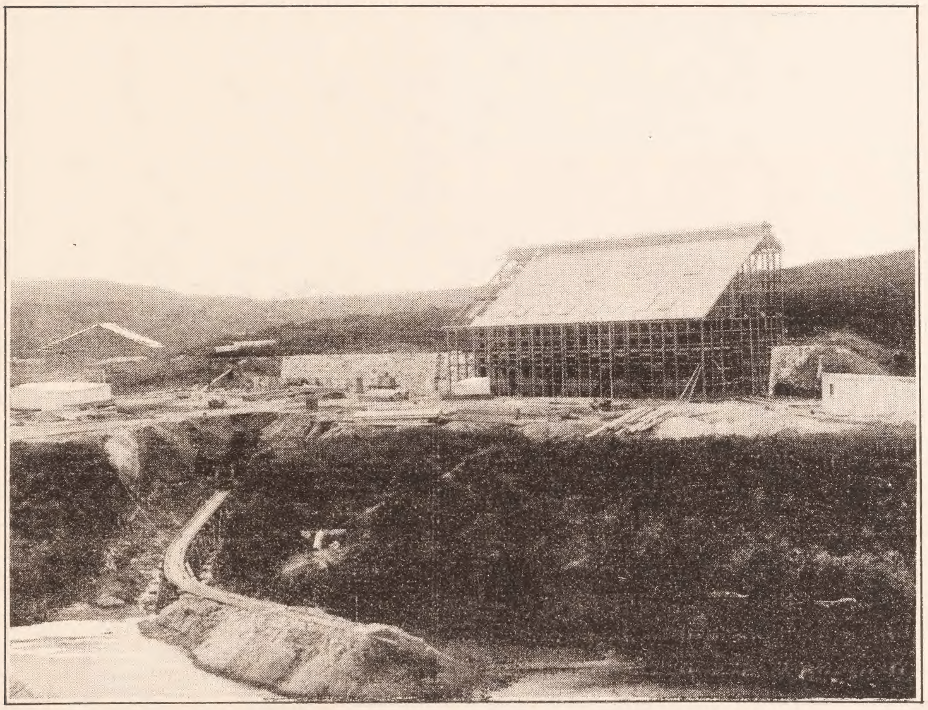
Gloucester.—This company's property is undergoing vigorous prospecting. A considerable amount of trenching and driving has been done, a shaft has been sunk to a depth of 140 ft., and a whim erected for haulage purposes, but it is intended to replace this by a pumping- and winding-engine capable of sinking to a depth of 400 ft., or further if required. The foundations are to be built with concrete, and will be of a substantial character, the estimated cost of the engine, pumps, poppet-heads, engine-house, and everything complete being about £1,950. This is one of the most promising properties in the Karaka Creek, and is being explored by an English company, whose attorney in New Zealand is the Hon. William McCullough, M.L.C. The development works are being carried out in a satisfactory manner under the supervision of Mr. Thomas McCullough. A fair quantity of gold has been obtained from time to time from the various leaders and reefs in the surface drives, and there is every prospect of gold being got at a depth, as the parties who had previously worked on the property obtained gold as far as they were able, with their primitive appliances, to keep the water down. The Lincoln Special Claim has been secured by the company's attorney, and negotiations are proceeding for the purchase of the Manchester Claim. This should prove a valuable addition, as the Manchester tributers found a body of quartz 3 ft. wide, some of the ore from which has been tested as worth £2 15s. per ton by the battery treatment.

Puru Consolidated. — This company have commenced to erect their battery, which will consist of ten stampers and two amalgamating-pans. The water-race, about half a mile in length, is in course of construction, and will give a fall of 28 ft. at the battery. An aërial tramway, 33 chains in length, is being put up to convey the quartz from the mine to the crushing plant. When the mill is completed the company will be in a position to convey the quartz to the mill and crush it at a very small cost. The reef, which averages about 3 ft. in width, has been opened up for a considerable distance. Gold was frequently seen in the quartz as it was broken out, and the assay tests have been favourable.

Thames-Hauraki.—This company are pushing on with the Deep Sinker shaft. There is a slight improvement in the country at the bottom of the shaft, and there is every probability that the shaft has been



Waihi Gold-mining Company.—Second Fifty Head of Stampers of Victoria Mill, Waikino.



Waihi Gold-mining Company.—First Fifty Head of Stampers of Victoria Mill, Waikino.

proceeding through a patch of hard country such as is frequently met with in the district, but in most cases extends no great distance in any direction. The erection of the large pumping-engine is not proceeding quite as speedily as expected, but this is due to the fact that portions of the machinery are not coming to hand as soon as expected from England, this being probably due, in some measure, to the dispute in the engineering trade.

CINNABAR AT MAUNGAKIRIKIRI.

There appears to be three runs striking approximately north and south, and dipping towards each other. The first deposit—*i.e.*, the most easterly one—was disclosed in a small surface-trench, from the earthy portion of which good tails of cinnabar could be obtained by panning, and at the bottom of the trench a lode formation appeared to be making in a north and south direction. The westerly runs are contained in a lode formation of flinty quartz mixed with a considerable quantity of decomposed country-rock. The cinnabar could be distinctly traced in veins of 2 in. or 3 in. in thickness, and also as particles impregnated through a large portion of the gangue. About half a dozen surface cuts, from 3 ft. to 8 ft. wide, have been made into this formation in a distance of 60 yards along the side of a ridge, and in each place cinnabar is obtained on pounding. The surrounding country, where clearly seen, was a decomposed andesite.

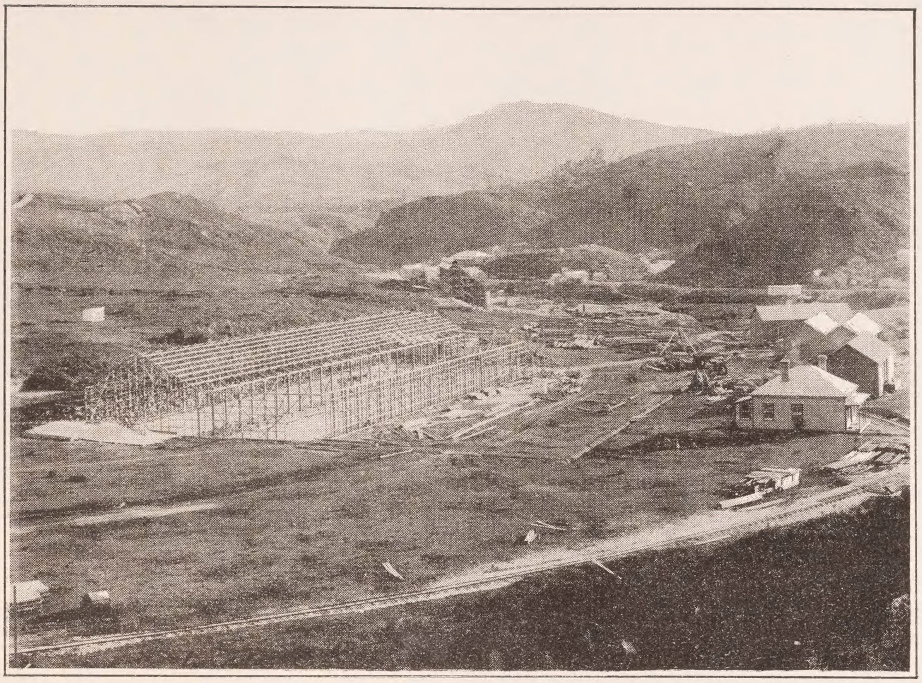
The ridge into which this run dips is steep and abrupt, and, it is anticipated, will be proved to be a similar formation (carrying cinnabar) to that exposed; also its western side; and it is stated the cinnabar-bearing formation will not be less than 60 ft. wide. The formation is opened at another place 10 chains further on, but was not visited.

Karangahake.

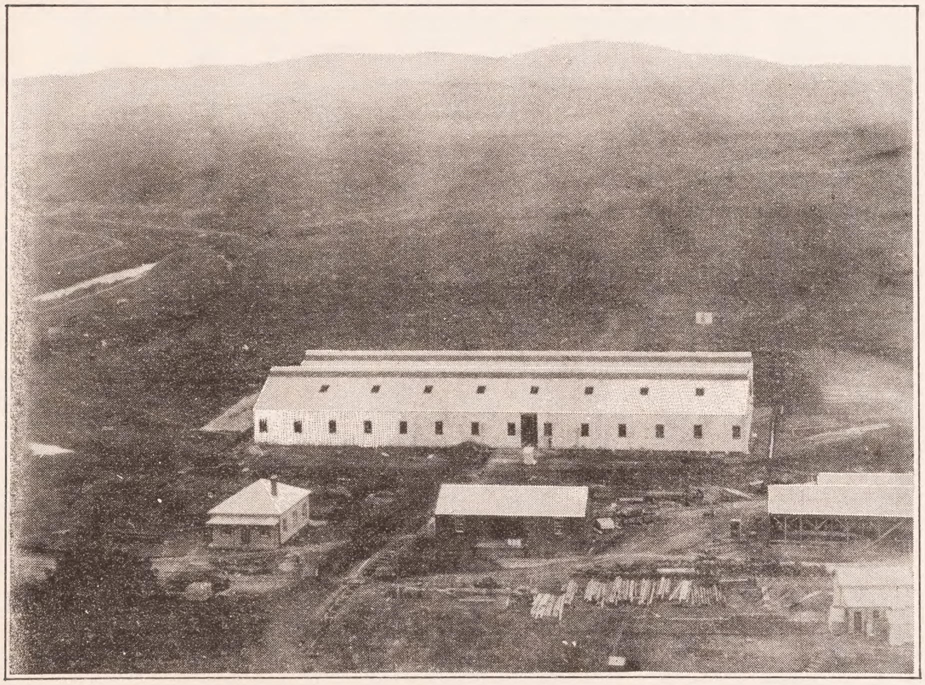
Woodstock.—The following is a brief description of the development work accomplished in the Woodstock Gold-mining Company's mine, Karangahake, furnished by the manager, Mr. John McCombie: No. 1 Level, Maria Lode: This is the highest level in the property, and the backs overhead range from 30 ft. to 300 ft., according to the contour of the country, which rises very abruptly going southwards. It is approached by a cross-cut 200 ft. in length, and the lode, averaging 4 ft. in thickness, has been driven upon for a distance of 520 ft. This level has been timbered for a length of 300 ft. along the lode, which carries gold and silver in payable quantities throughout, and two distinct blocks are all ready for stoping operations. Intermediate Level, Maria Lode: The cross-cut leading up to this level is 500 ft. in length, and several gold- and silver-bearing lodes were intersected during its progress. The last lode met with was that known as the Maria, which has now been driven upon south of the cross-cut for a distance of 321 ft. Connections with No. 1 level have been effected at two distinct points, partly by rising and partly by sinking, and the vertical height of the block opened for stoping between the two levels is 120 ft. Throughout the whole of the workings above this level the lode averages 4 ft. in width, and the ore is oxidized, comparatively easy to break, and payable. No. 2 Level, Maria Lode: Access to this level is gained through medium of a cross-cut 180 ft. in length, and since the lode was encountered it has been driven upon for a distance of 805 ft. southwards. Here the lode varied from 4 ft. to 5 ft. in thickness, and the bulk of the ore met with in driving was of good quality. It is located 140 ft. lower down than the intermediate level, and is connected therewith by means of a rise, which has been put up on the lode from point to point. There are two distinct rich ore-shoots, named respectively "Woodstock" and "Hauraki," at this level, and in between these two shoots there is a small block where the lode is disturbed and the ore comparatively low grade. This level has been securely timbered where required, and stoping operations are now in full swing on both ore-shoots. No. 2 Level, Cross-cut West: This cross-cut has been driven westwards a distance of 700 ft., and no less than five separate ore-bodies, carrying more or less gold and silver, have been intersected therein. The principal one is known as "Shepherd's Lode," which runs from 12 in. to 13 in. in thickness, and, so far as developments have gone, is the richest lode in the mine. From time to time during the past few years 236 tons of rich ore was broken out from this lode and shipped to Freiburg, where it was sold at 90 per cent. on its assay-value, realising £10,190; and then there was a very large tonnage of lower-grade ore dealt with by various processes locally with very fair results. Later on the work of exploiting the other lodes met with in this cross-cut will be undertaken, and there are strong indications of the outcome being satisfactory. No. 3 Level, Maria Lode: The total length of this level is 950 ft., and, bar two breaks, each having a disturbing influence for a few feet, the lode, varying from 3 ft. to 15 ft. in thickness, carried a high percentage of the precious metals. Above the level, on the Woodstock ore-shoot, which is 450 ft. in length, about 3,000 tons of ore has been blocked out and treated by the cyanide process, and the total bullion return realised £11,129, being about 80 per cent. of the assay-value. Stoping operations are now in progress over the back of the level, on the Hauraki ore-shoot, and the ore coming to hand is all high grade. Between the Nos. 2 and 3 levels the block is 140 ft. in depth, and there is a large tonnage of ore available for stoping, with all the necessary winze and rise connections complete. No. 4 Level, Maria Lode : This level is located 80 ft. below the No. 3 level, and it was started almost end on to the line of lode. It is now in about 1,000 ft., and has been timbered for fully two-thirds of that distance. Here the lode is stronger and richer in the precious metals than was the case at the level above. Stoping operations are now in progress in the Woodstock and Hauraki ore-shoots, and high-class ore is being obtained from both places. Connection with the No. 3 level has been effected by means of two rises put up at stated intervals apart in the first-mentioned ore-shoot, and similar connections are now under weigh in the last-mentioned ore-shoot. At present the actual size of the lode in the Hauraki ore-shoot has not been determined, because it has only been broken out to the average width of the level—about 5 ft. Indications are not wanting, however, to prove that it will run from 6 ft. to 15 ft. in thickness, and that the whole of the ore will be of exceptionally good quality. No. 5 Level, Maria Lode : This is the lowest level obtainable in the mine, bar sinking, and is situated 80 ft. below the No. 4 level workings. Since starting operations here the distance driven—mostly on the line of lode—is 684 ft., which brings it under the Woodstock ore-shoot, and a further distance of 320 ft. remains to be accomplished before it reaches under the Hauraki ore-shoot. South of the No. 1 winze, which was sunk from the No. 4 level, some very rich ore has been met with in stoping out. This occurs as a narrow band running irregularly through the lode, and it is heavily charged with gold in particles by far too coarse for successful cyanide treatment. During the past four months 4¾ tons of this rich ore was dealt with in Fraser's pan plant, Auckland, for a return of £835, which represents about 85 per cent. of the assay-value, and the remainder of the ore was treated by the cyanide process. No. 5 Level Cross-cut West : A distance of 400 ft. has been reached in this cross-cut. The object sought to be attained in the extension of this cross-cut was the intersection of the Woodstock lode, which is located about 450 ft. west of, and runs almost parallel with, the Maria lode. During its advancement several gold- and silver-bearing lodes were met with, notably Shepherd's lode, which contains a very high percentage of the royal metals, and upon which developments will be started very shortly. This cross-cut will afford 380 ft. of backs, beneath the old workings on the Woodstock lode, which averages 8 ft. in thickness, and has proved itself to be a bullion-producer of no mean quality wherever operations have been carried out upon it in the past. It will thus be seen that the prospects of meeting with a large body of high-grade ore here are very promising, and below the old workings this lode is intact throughout the full length of the mine. Ivanhoe Section : In this section of the mine about 600 ft. of scarfing and tunnelling have been done in order to make the continuation of the lodes north of the Waitawheta River accessible. This is now an accomplished fact, and exploiting the lodes in question will be next in the order of things.

Bullion Returns : Between the month of February, 1897, when the new forty-stamper mill was started, and the 1st January, 1898, the ore dealt with by the cyanide process from all parts of the mine was 10,367 tons, for an all-round bullion return amounting in value to £32,530 14s. 1d. Owing to the difficulty of treating the ore the extraction was comparatively low, but it is confidently expected that the current year's operations will be attended by more satisfactory results.

Wet-crushing : Experiments in the above connection have been going on for some time, and the results are so good that contracts have now been let for converting the whole plant from dry- to wet-crushing as speedily as possible. The only difference between the use of a dilute solution of cyanide in the mortar-boxes and ordinary wet-crushing with water is that the solution is made to describe a circle, while the water, after doing its work, is usually allowed to run to waste. To begin with, the solution is made up generally in the sumps, from whence it is pumped to the stock solution-vats that are located at a high elevation, so as to admit of the solution flowing automatically through a pipe into the mortar-boxes, which, of course, are charged simultaneously by the self-feeders with raw ore. After stamping the pulp, solution and finely-reduced ore passes through the 40-mesh screens and drops on to an apron, which is fixed in front of the mortar-boxes. Going away from the boxes this apron contracts and terminates in a launder, which conveys the pulp to the vats, over which it is distributed by means of cross launders. This system of filling vats is somewhat primitive, and later on it will be improved upon by the introduction of automatic distributors. When No. 1 vat is full the pulp is directed into No. 2 vat, and thence into



Waihi Gold-mining Company.—General View of Victoria Mill and Cyanide Plant.



Waihi Gold-mining Company.—Tank-shed of Victoria Mill, Waikino.

No. 3 or No. 4 vats, as the case may be. Within two hours the slimes are settled sufficiently to permit of the solutions being siphoned off No. 1 vat, from whence they are conveyed by a launder to the sumps, and from there they are pumped up to vats fitted with filters for eliminating any slimes that may be suspended therein. Once through the slime-vats, the solutions find their way down pipes, arranged for the purpose, to the extractor-boxes, where the gold and silver is deposited on the zinc shavings, and then they pass into the storage sumps, where they are rehabilitated and subsequently pumped up to the stock solution vats to pass through the same routine again and again. The time taken to fill a vat with pulp varies considerably, according to the character of the ore, and the volume of solution used in the mortar-boxes. The quantity of solution brought to bear on wet-crushing varies from 2½ to 3½ tons per ton of ore, and it is necessary to turn the pulp into the vats three or four successive times, and settle and siphon off the solutions during the intervals before the requisite quantity of ore, say 30 tons, is deposited in each vat. With this system of treatment two important factors in the successful working of the cyanide process are brought to bear on the ores—namely, agitation and oxygen. In fact, fully 40 per cent. of the bullion-value is extracted before the ore leaves the mortar-boxes, and by the time the pulp reaches the vats the solutions have absorbed 50 per cent. of the assay-value, on the average. There is but little difference in the time required for treating ore either wet or dry, and the waste solutions or water-washes are put on and pulled off by the vacuum pumps, the same way in both instances. There are no scientific or chemical problems to be solved in connection with the working of this process. It is a purely mechanical business from start to finish, and the system under which it is worked, by siphoning the solutions off the top of the charge, after allowing the slimes to settle, has been used in pan-amalgamating plants for many years. The success of the wet process, when applied to the treatment of Woodstock ore, may be attributed solely to the fact that the ore is crystalline, free from clay and earthy matter of every description; consequently, the percentage of slimes formed in wet-crushing is *much less* than is the case in dry-crushing, because the ore is leached out of the mortar-boxes by the dilute solution of cyanide as soon as it reaches the required degree of fineness to pass through the screens. This accounts for the rapidity with which the water-washes go through the vats containing wet-crushed ore as compared with the vats that have been filled with dry-crushed ore, because the latter is stamped so fine before escaping from the mortar-boxes as to form a high percentage of slimes, and these invariably retard the work of water-washing the ore charges. Briefly stated, all other things being equal, the success of the wet system depends entirely on the question of slimes, and these are produced in wet-crushing *only* through the presence of clay or other earthy matter that may be inseparable from the ore before treatment.

New Zealand Talisman.—Owing to the unusally dry weather, and consequent shortness of water in the Waitawheta River, five head of stampers had to remain idle, the yield of bullion being on that account smaller than usual last month. Beyond having a few trial runs, it has been found impossible, for the reason stated, to utilise the Krupp mill which has just been erected. As there is an abundance of quartz on hand and in the mine, it is probable the company will have to resort to steam-power when the river is low.

Woodstock Main Reefs.—This company have twenty-one men employed in prospecting operations at the different levels. At No. 6 level, which is in a distance of 628 ft., twelve men are engaged driving on the reef, and cross-cutting east and west. The reef varies from 3 ft. to 14 in., but at present the ore is of a rather low grade. In No. 3, or Ivanhoe level, six men are driving the cross-cut, which is in about 600 ft., to intersect a reef which crops out on the surface, about 10 ft. in width, from which prospects were obtained.

Owharoa.

Ohinemuri Syndicate.—At this mine there are twenty-one men employed—twelve underground, and nine on surface. A shaft, 12 ft. by 6 ft. in the clear, has been sunk to a depth of 143 ft. A chamber was opened out at a depth of 120 ft., and two cross-cuts are being proceeded with. The north-west cross-cut is in 75 ft., in a good class of country; the cross-cut going north-east is in a distance of 89 ft. from the chamber, and it is expected that the Radical reef will be cut in a few feet more. It is intended to intersect several reefs worked in the higher levels from the shaft. They have just completed the erection of a winding- and pumping-engine on this shaft. It works very satisfactorily, and will enable the development of the mine to be proceeded with for some time to come.

Waihi.

Waihi.—Everything in connection with the new mill and cyanide plant at Waikino is in a forward state, and crushing will shortly begin. Water has been brought into the low-level race, and the contractors are busily engaged in supplying firewood for the kilns.

Waihi-Gladstone.—There are nine men employed on this mine. The principal work is sinking a winze, which is down to a depth of 65 ft. on the No. 3 reef, which averages about 6 ft. in width, from the 100 ft. level. The reef has been opened up for a considerable extent on this level, and appears to improve in size and quality as it goes down. The shaft, which is 6 ft. by 3 ft. in the clear, and worked by a horse-whip, has been sunk to a depth of about 175 ft.

Waihi Extended.—There are at present only four men employed on this ground. They are driving a prospecting level, which has been carried 300 ft. through fairly tight country. Several small leaders have been cut, but so far nothing of any importance has been discovered.

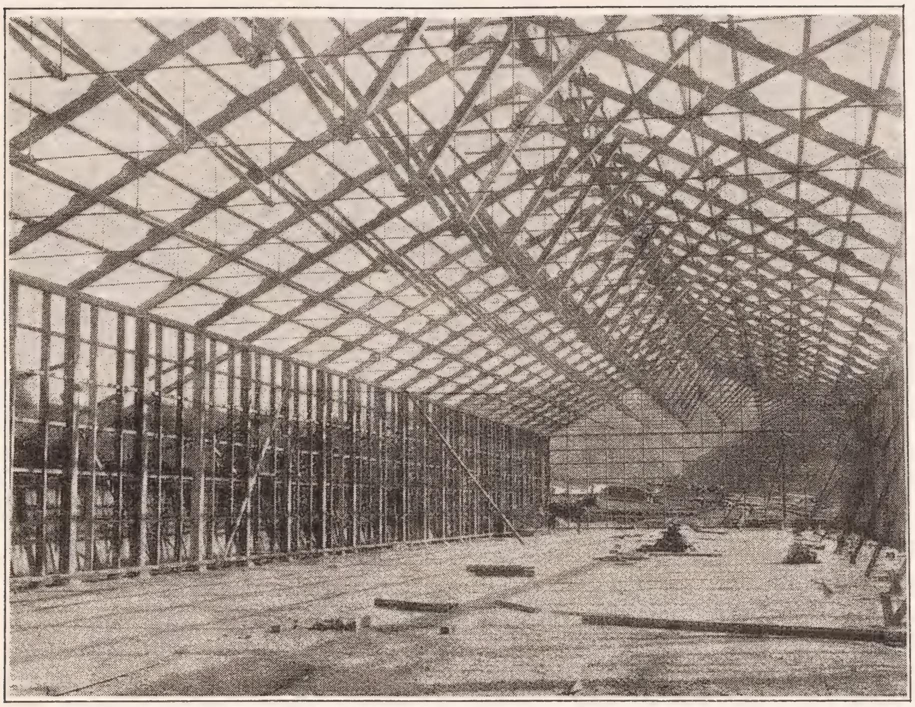
Waitekauri.

Waitekauri.—Works in this mine are proceeding satisfactorily. During the holidays the machinery was thoroughly overhauled, and everything is now running smoothly. At the kiln level the reef has been driven on for a distance of about 650 ft. The following statement shows the number of tons of ore treated, the product in ounces of bullion, and value thereof, from the 1st March, 1895, to the 11th December, 1897 :—

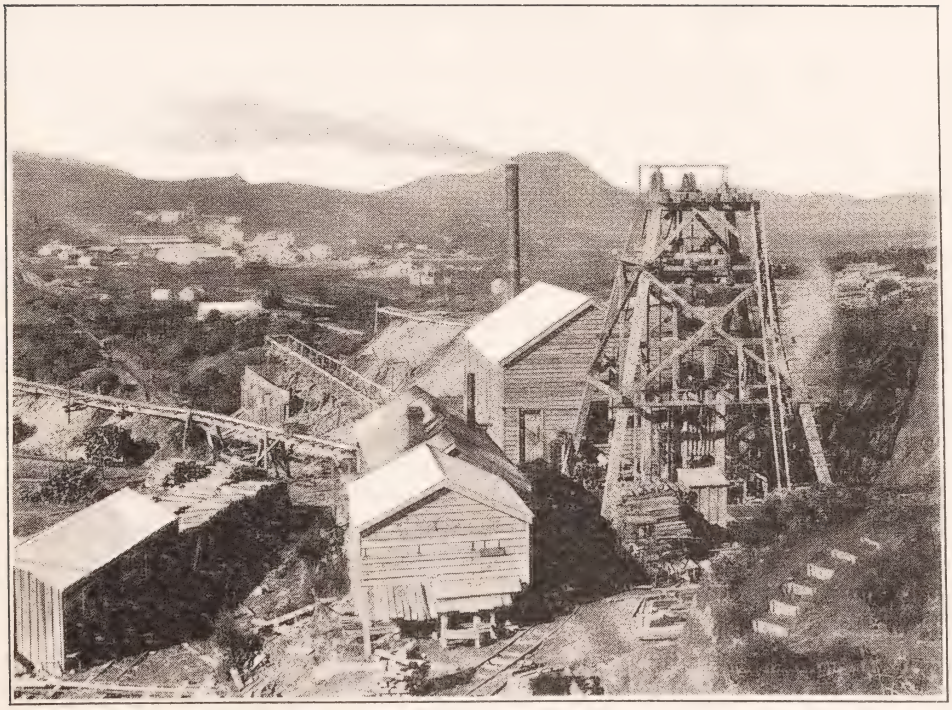
Period.	Tons.	Oz.	Value.		
			£	s.	d.
From 1st March, 1895, to 30th May, 1896 ..	2,331	12,686	12,403	16	7
From 30th May, 1896, to 31st May, 1897 ..	15,165	36,980	40,881	2	0
From 31st May, 1897, to 11th December, 1897 ..	13,446	26,485	28,931	9	11
Totals	30,942	76,151	£82,216	8	6

Golden Cross Section: The company have 105 men employed underground on this section of the property at the No. 1 and No. 2 shafts, and forty men are engaged on the surface at different works. No. 1 shaft is down 305 ft.; it is intended to sink to a depth of 330 ft. before opening out for the next level. Driving and stoping operations are proceeding on the reef upwards from a depth of 130 ft. on the No. 1 level, and in No. 2 level, at a depth of 100 ft. below No. 1, the main cross-cut, driven to intersect the reef at this level, is being vigorously proceeded with. The shaft is down a depth of 75 ft. below the No. 2 level, and requires sinking a further depth of 25 ft. before opening out for the next level. There are at present two shifts of men employed in the shaft putting in cistern and making preparations for sinking. It is intended, when the proper level is attained in the shaft, to drive a cross-cut to connect with the Socket tunnel, which is in a distance of 1,764 ft. Ten men are at work in this tunnel, which requires to be driven a further distance of 4,400 ft. to make connection with the shaft. There is a double object in putting this tunnel through—namely, to prospect the ground, and give direct transit for the ore from mine to battery. The No. 2 shaft is down a depth of 195 ft., and at 185 ft. a chamber was opened out, and a cross-cut is being driven west to intersect the reef, which they expect to cut a few feet further on. A small drive was put in to the right of the main cross-cut, and tapped the reef for the purpose of draining it, previous to driving the main cross-cut into it. There was a great body of water coming from the reef, which filled up the level and chamber, stopping operations for some time; two large iron tanks, built to fit the cages, were kept continually at work till the water was taken out and the reef drained off. It is fairly dry at present, a Tangye keeping the water down. The erection of the pump and pumping-engine is in a forward state, and the winding-engine has been erected and working for some time. The plant is a very complete one, and will enable the mine to be developed to a great extent. There is also a good pumping- and winding-plant at the No. 1 shaft. Four men are driving on the reef in the Waitekauri Section, with the view of connecting with the New Zealand Jubilee workings, which that company are pushing on from their end, for the purpose of securing natural ventilation in both mines.

New Zealand Jubilee.—Forty men are employed in this mine. In No. 2 level, which is 78 ft. below No. 1, there are twenty-four men engaged in driving and sinking operations. They are sinking a shaft from this level at a distance or 600 ft. from the mouth of the tunnel, which is in 1,000 ft. This level is being driven south-east to intersect the Waitekauri reef, which they expect to cut after 80 ft. more has been driven. What is supposed to be a dropper from the reef, about 7 in. in width, has been cut, and looks very promising. It is intended to connect this level with the Waitekauri workings on the reef, for the purpose of securing natural ventilation. There are sixteen men engaged in connection with the sinking of the shaft and the erection of the machinery, the shaft, which is 9 ft. by 4 ft. in the clear, having already attained a depth of 50 ft. A large chamber has been cut out in this level, and poppet-legs erected over the shaft, which is to be



Waihi Gold-mining Company.—Tank-shed of Victoria Mill.



Waihi Gold-mining Company's No. 1 Shaft.

worked by two small Tangyes, boilers, and engine, which are in position, and ready to start in a few days. A rise has been put through to No. 1 level to carry off the smoke and steam. The chamber is 32 ft. long and 16 ft. wide, and the main sets 17 ft. high, securely timbered. The shaft is going down on the foot-wall of Christie's reef, and it is also intended to intersect the Waitekauri reef from this shaft at a deepth of 300 ft. At the low level there are nine men engaged driving on the reef; the drive is in a distance of 1,400 ft., the width of the reef being from 3 ft. to 4 ft.

Waitekauri United.—This company have twenty-seven men employed, and are pushing on with the extension of the No. 1 and No. 6 levels. No. 1 level is being vigorously proceeded with, three shifts of three men being engaged on the work. The rock-drill, which is worked by compressed air, is used for driving this level, which is in a distance of 1,500 ft., but nothing of a payable nature has yet been met with. The No. 6 level, which is being driven from the western side of the property, is in 350 ft., and it is expected that the Waitekauri reef will be cut after another 50 ft. has been driven. It is intended to connect this level with No. 1 level.

Waitekauri Union.—Western Section: There are nineteen men employed on this section of the company's property. The main low-level tunnel, which is in a distance of 530 ft., is going on as fast as possible, but the country is very hard, which makes the progress rather slow with hand-power. The level is driven with the intention of cutting the Te-Ao-Marama reef at a distance of 1,500 ft. from the mouth of the tunnel. An air-compressor engine is to be placed close to the mouth of the tunnel for the purpose of working the rock-drill, which will expedite the driving of the level. A considerable amount of surface work—road-making and excavating for plant, now nearly completed—has been done, and it is expected that the engine will be running in the course of a few days. Eastern Section: Fifteen men are employed on this section. Sinking of the main shaft, which is 10 ft. 6 in. by 4 ft. in the clear, is proceeding, and the shaft is now down to a depth of 60 ft., penetrating a soft class of country. It is intended, before opening out, to sink 300 ft., at which depth a cross-cut will be put in to intersect the Golden Cross reef. A small winding plant has been erected on this shaft, also a Tangye pump, which is considered capable of going down the required depth. A considerable amount of surface work has been done on this section in road-making, &c., for the purpose of getting the machinery, which has been erected and works satisfactorily, on the ground.

Grafton United.—This company have eight men employed. The principal work is driving the low level—which is being pushed on with three shifts—to intersect the Golden Cross reef. They are in a distance of 550 ft., and expect to cut the reef in another 100 ft. The drive is at present penetrating a rather tight class of country.

A slight accident occurred on the 10th January in this level to a miner named George Barry, through a cap and primer exploding in his hand, slightly injuring and putting him off work for a few days. It was attributable to carelessness on his part, as he had a proper covered canister, but did not make use of it.

Alpha.—This company have thirty-two men employed, and are going in to thoroughly open up the reefs at various depths. The indications are of an encouraging nature, and there is a fair body of stone, which prospects well. There are four different levels working at present, twenty-eight men being engaged underground. The low level is in 227 ft., and is being pushed ahead vigorously with three shifts. No. 5 level, which is 100 ft. above the low level, is in a distance of 32 ft. No. 4, which is 100 ft. above No. 5 level, is in 274 ft.; and there is a rise through on the reef to the surface for a distance of 98 ft. All these levels, including the western, recently started, are being expeditiously pushed ahead, so as to have them connected, and the reef will be opened up by the time the battery is erected. The company have decided to erect a 20-head mill for wet-crushing, to be worked by steam-power. All the necessary excavations for the battery-site are nearly completed, and the manager is now anxiously waiting for the completion of the road, so as to get the machinery on the ground before the wet weather sets in.

Waitekauri Reefs.—Six men are employed on this company's ground, four of them being engaged in cleaning out and retimbering the Stevens's No. 2 level, for the purpose of extending it to intersect the Waitekauri South No. 2 reef. In the low level of the British Empire section two men are driving on the reef, which averages about 2 ft. 6 in.; but the ore, though of a kindly quality, is not, so far, considered payable.

Young New Zealand.—Five men are employed cleaning out and retimbering the low level, which is in a distance of 460 ft. It is intended to extend this level, with the view of intersecting a series of reefs cut and worked at the higher levels, the principal object being to get under the Welcome reef, where a considerable run of gold was obtained in the early days. About 200 ft. more will have to be driven to reach the desired point: this will give 100 ft. of backs on the reef to the next level. A start has been made with a rise through from this level to the surface, for the purpose of ventilation, which is rather defective at times.

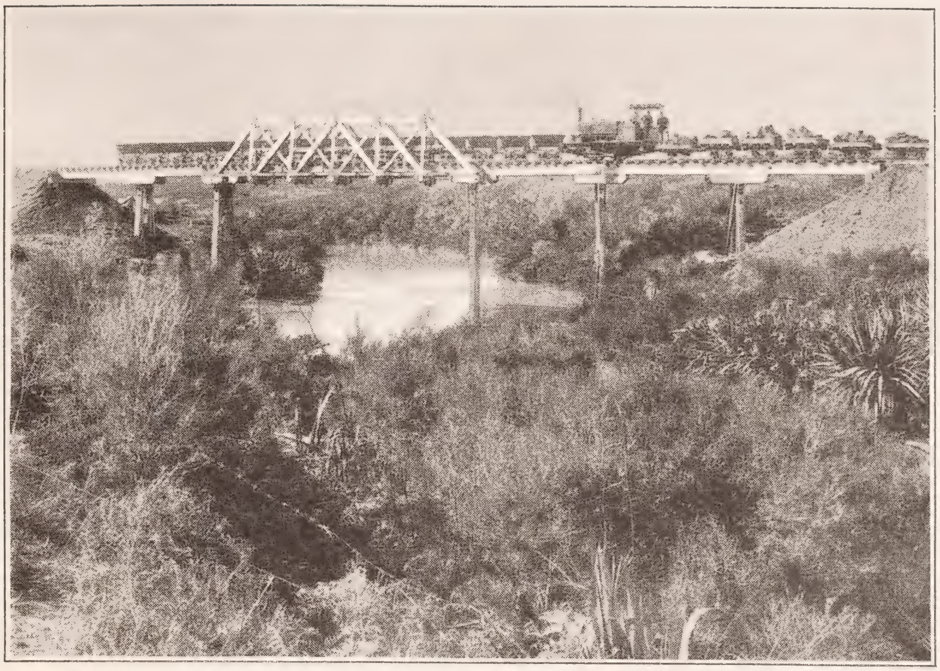
Grace Darling.—Five men are employed in this mine rising on the reef to the surface from the No. 2 level, and timbering the No. 2 level for the purpose of stoping the reef south. The reef, which averages 5 ft. in width, has been driven a distance of 400 ft. to the south, this block being intact to the surface and ready for stoping. The reef has been driven on north to the surface a distance of 300 ft., a good deal of the reef being stoped at this end. All the ore broken down is saved for treatment. It is intended to make some slight alterations and repairs to the battery before putting any more ore through it. The reef looks encouraging, and with proper treatment the ore is considered payable.

Waitekauri Junction.—There are four men working in this mine. They are driving a low level from the creek to intersect a reef trenched on the surface, and from which prospects have been obtained. The level is in a distance of 60 ft., and about 40 ft. further will have to be driven in order to cut the reef at a depth of 45 ft. below where it was trenched.

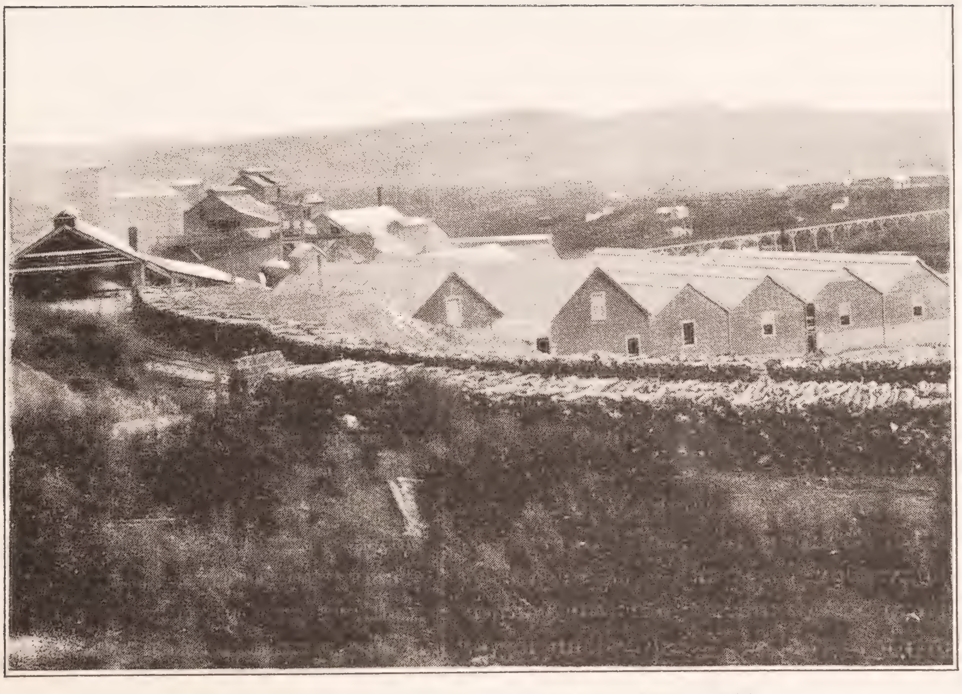
Te Aroha and Waiorongomai.

The thermo-hyperphoric reduction plant is approaching completion, under the superintendence of the Rev. Joseph Campbell. The building, in which there are three floors, is 100 ft. by 80 ft. In the upper floor a 9-horse-power boiler, heated by Waikato coal, will generate the steam to work the Dowson gas, for which purpose a gasometer, 12 ft. in diameter, a generator, and purifier have been erected. This gas will be used for driving a 75-horse-power gas-engine. The plant for the thermo-hyperphoric treatment (which has not yet arrived) will consist of three generators, to be worked on the intermittent system. These will be on the second floor. The producer gas, which is first made, is used for heating the furnace, and the water gas for the thermo-hyperphoric treatment. A stone-breaker will reduce the ore to ½ in. mesh, and it will then pass on to an Askam Brothers' Tiger mill, capable of pulverising it to any degree of fineness required, the present intention being to reduce it to the size of grains of wheat. The ore will then be elevated to large hoppers, erected over the furnace, from which three smaller hoppers are to be fed. These will immediately discharge into the furnace, which is to be heated up to 2,000 ° Fahr. by the producer gas, and will consist of a bed of eight retorts, with a capacity of 40 tons per day. Whilst in the retorts the ore will be subjected to the action of the water gas, which it is claimed has the effect of eliminating all the base materials, or reducing them to such a condition that it does not interfere with amalgamation. The ore is then conveyed to a Merrill's Tension mill of 40 tons a day capacity, with a mesh of about 40 to the inch. This mill, in which mercury is to be used, both grinds and amalgamates, and it is anticipated that a saving of 80 per cent. of the gold will thus be effected. From the mill the ore is conveyed by launders to three "Gold King Amalgamators," which it is expected will save the greater portion of the residue, or in all about 95 per cent. Work is at present being carried on in the Montezuma and five other properties, in which the lodes are being systematically opened up. A self-acting wire tram is on the ground, and will be erected as soon as the most suitable place has been determined. The cost of treatment of the ore, from the time it is delivered at the mill, is estimated by Mr. Campbell at not more than 8s. per ton, and, as it is anticipated that 95 per cent. of the bullion will be saved by the thermo-hyperphoric process, it should prove a cheap method of treatment for the large bodies of low-grade ores at Te Aroha, Waiorongomai, and other places, and be the means of affording employment to a large number of miners.

Montezuma.—Four men are driving the No. 2 level on the Waterfall reef, which is about 2 ft. 6 in. in width, but of a rather poor quality; the drive is in a distance of 235 ft. On the Waitara section four men are driving a cross-cut, with a view of cutting a reef that has been trenched on the surface; it appears to be a large body of stone, but a good deal broken up. They are in a distance of 200 ft., in a rather soft class of country, and expect to cut the reef in 40 ft. more. On the Plutus section two men are engaged in surface prospecting, and two are clearing a line for a wire-tram to connect the mine with the Tui hopper, some stone having been broken out of the reef at this mine which they intend sending to the battery for treatment, and they are going to make use of the Tui aërial tram, which is to be connected with the battery by ground tram. Six men are engaged on the Grand Result section in breaking out 100 tons from the reef for a trial crushing when the battery is up. They expect to have everything in readiness for crushing in the course of a few weeks.



Bridge over Ohinemuri River, Waihi Gold-mining Company's Waihi–Waikino Railway.



Waihi Gold-mining Company.—General View of Waihi Mill.

Champion.—Work at this mine is almost suspended for the present, pending the completion of the Rev. Joseph Campbell's thermo-hyperphoric plant, to which it is intended to send a parcel of ore for treatment.

Te Aroha.—The low level is in a distance of 970 ft. Twelve men are engaged on a contract in the tunnel, which has been reduced to 8 ft. by 8 ft., two wages-men being also employed. The work is being done by manual labour. Six men are driving a cross-cut across the run of the reef. Eight men are working in the Colonist Creek level; the cross-cut is in a distance of 420 ft., and the wall of the reef has been driven on both ways 300 ft. The Silver King level, off the upper horse-track, in which six men are employed, has been driven 240 ft. along the lode.

Great Western.—This mine, in which twelve men are employed, is the property of the Hauraki Development Syndicate, of which Mr. Farquharson is the general manager. The low level has been driven 200 ft., and the Eureka level 300 ft., which will give 230 ft. of backs to work on. In the low level the reef is 6 ft. wide, and in the Eureka 4 ft. wide. A wire-tram, 16 chains in length, will convey the ore to the battery, which is situated on the side of the hill near the old New Find hoppers, and a stone-breaker will reduce it down to 2 in. There are four kilns, 6 ft. in diameter and 20 ft. deep, constructed on a similar principle to the kilns at the Waihi Mine. The ore is to be elevated from the kilns to a dry-crushing Chilian mill, which will reduce it to ½ in. mesh. It will then pass on to the air-blast classifier, the "roughs" being sent back to the mill and the "fines" retained in the hoppers. There are six small cyanide-vats, about 10 ft. in diameter each.

Burt's Find.—The Piako County Council have made the pack-track to Burt's Find for a distance of two miles and a half, and pack-horses can now be driven to it with stores.

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NELSON-WESTLAND GOLDFIELDS.

Collingwood.

Number of special claims and licensed holdings in force at Collingwood on the 31st December, 1887, and the 31st December, 1897, showing also the total area and the rent payable :—

Number.	Purpose for which granted.	Area.			Annual Rental.		
	31st December, 1887.						
		A.	R.	P.	£	s.	d.
7	Quartz	83	2	36	71	0	0
1	Sluicing	9	0	0	4	10	0
8	..	92	2	36	75	10	0
	31st December, 1897.						
11	Quartz	403	2	10	220	0	0
18	Sluicing	860	3	34	423	0	0
2	Coal-leases	139	0	0	29	17	6
31	..	1,403	2	4	672	17	6

Besides the above, the Warden granted five dredging-claims on the 15th December, subject to the approval of the Hon. the Minister of Mines. These embrace an area of 301 acres, and if all are taken up the first annual rent will be £75 5s. A quartz claim was also granted on the same date, and is in a similar condition. This embraces an area of 62 acres 3 roods, and the first annual rent will be £15 15s.

The Taitapu Gold Estates, at West Wanganui, are mining on their own private property, and consequently do not appear in the above return. They have just completed a 20-head battery, and crushing may be expected to commence any day.

During the year ending the 31st December, 1887, eighty ordinary applications for water-races, claims, tail-races, &c., were lodged. For the same period in 1897 there was an increase of forty-two. This shows that the small miner is not yet extinct, although a great number of them have lately been employed by the companies.

The Collingwood Goldfields Company have completed the erection of their sawmill, and are turning out between 4,000 ft. and 5,000 ft. of timber per day for the erection of the fluming, to bring water on to their leases at the Quartz Ranges from the Boulder Lake. The timber will be taken across the Aorere River in a punt to be erected to carry 10 tons, and worked from an overhead wire rope. The natural current of the river will carry it backward and forward, and only one man will be required to work it. A tram-line is formed from the river to their leases, a distance of four miles, and an excellent grade obtained throughout. The laying of the rails is to be at once put in hand, after which the construction of the race will be commenced without delay. This company are now employing forty men.

Upper Buller.

Buller Dredge Company.—It is expected that the new dredge now being built for this company will be completed and at work early in June.

Crushington.

Keep-it-Dark.—There is nothing of importance to report from this mine. A solid reef has not yet been found in No. 7 level. 302 tons of stone have been crushed for the month, yielding 102 oz. 10 dwt. of gold.

No. 2 South Keep-it-Dark.—The contractors completed their contract for driving 200 ft. early in the month. Since then nothing further has been done. It is contemplated extending the cross-cut another 200 ft. at an early date.

Hercules.—At date of last report the contractors had extended No. 9 level north on reef track 35 ft. Since then they have completed their contract of 100 ft., and another has been let to them to drive an additional 50 ft., 30 ft. of which has been already done. The country driven through all along has been favourable for a reef, and at present time shows indications of not being far from a block of stone.

Devil's Creek.

Progress Mines of New Zealand (Limited).—The equipment of the Progress Mines of New Zealand (Limited) is now nearing completion, and within the course of two months the property will be producing to the full limit of its capacity. The various works embraced in this equipment comprise a new working shaft, which has been sunk to a depth of 950 ft.; hoisting-engine of a large capacity, boilers, head-gear, ore-bins, aërial tramway, 6,800 ft. long, connecting the mine with the new forty-stamp mill, water-race, forty-stamp mill with concentrators and chlorination plant. The water-race is 10½ miles in length, passes over exceedingly rough ground, and carries fifteen heads of water. The water is taken from the Inangahua River and delivered at the mill end under an effective head of 170 ft. Numerous deep gullies were met with on the line of the race, over which the water is carried through 18 in. and 20 in. diameter pipes. The race has a fall of 10 ft. in a mile, and the siphons a grade of 1·25 ft. to 100 ft. The ditch is 2½ ft. deep, 5 ft. wide at top, and 3 ft. wide on the bottom. Its capacity is considerably over the requirements for the new mill, and can readily be made to furnish water and power for a greater number of stamps.

Painkiller.

Dillon Extended.—Work in this mine has been limited to the extension of the low level, south. For some distance back a well-defined track was followed, and about the end of January a body of stone, averaging 2 ft. 6 in. in width, came in. It is of payable quality, and will be further driven on to ascertain its length.

Merrijigs.

Cumberland.—During the past month operations have been confined to prospecting and repairing in the upper workings, but nothing payable was found. The directors now intend starting work in the low level, and extending it north, where the country has a promising appearance.

Inkerman Combined Mines.—400 ft. of ground was opened up during the month of December, and 395 ft. during January, the total representing 708 ft. 6 in. of driving and 86 ft. 6 in. of sinking. The work has been carried out in various parts of the mine, but chiefly at Golden Gully, Revival Gully, Rainy Creek, and New Inkerman.

Sir Francis Drake.—No. 1 level has been driven north 50 ft., of which 20 ft. has been on quartz averaging 2 ft. 6 in. in width. A chamber has been cut out, and the sinking of winze from this level to connect with No. 2 level has been started, and is now down 20 ft. An uprise from No. 2 to connect with this winze has been carried up 26 ft. When the connection is made stoping on the reef will be resumed.

Victoria Range.

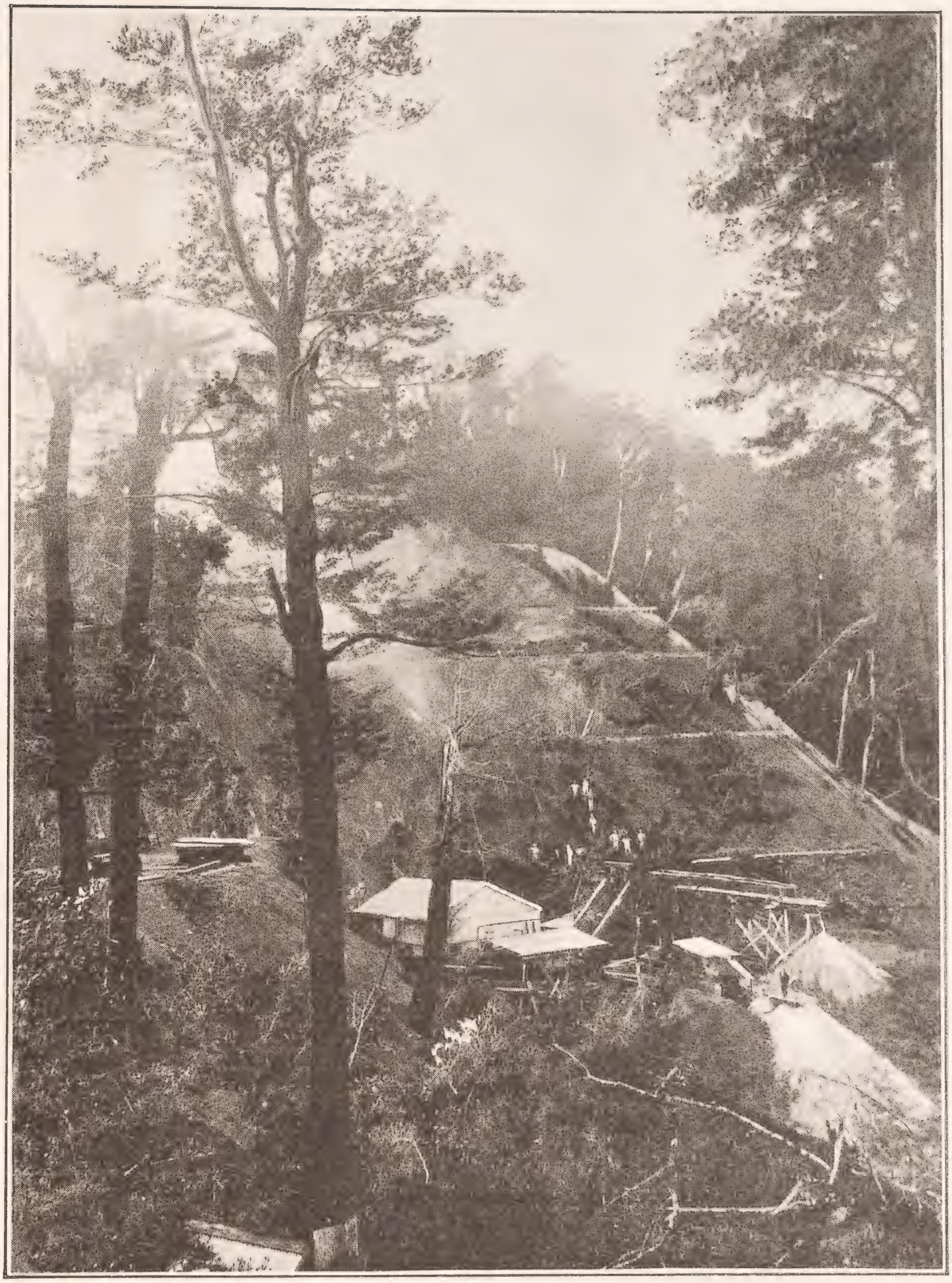
Boatman's Exploration Company.—This company hold eight licensed holdings, with an area of about 213 acres. Four men have been employed prospecting on these holdings since the beginning of December last. Several makes of stone of a favourable nature have been found. Negotiations are pending with the Anglo-Continental Syndicate for the option of purchase of three of the holdings, and a general meeting of the shareholders is to be held on the 4th proximo to consider the offer.

Charleston.

Most of the claims depending on the water-supply from the county dam have been more or less idle for the past three months, owing to the siphon giving way. The race from the county dam (the Argyle) is in a bad state all through, and it is estimated that £300 will be required to repair it. In the meantime the race is patched up so as to allow a small quantity of water to pass through, but this is not nearly enough for the miners' requirements. The Westport County Council have ordered the necessary iron from Sydney to effect the permanent repairs. The siphon is about fifteen years old.

The General Exploration Company have had granted to them protection over their three special claims and rights connected with them in this district. The protection will expire early in April. Operations are hung up for the present.

In the Lucinda Special Claim the tunnel is in



General View of Site of Globe New Shaft, Reefton.

500 ft., leaving about 250 ft. to complete. During the progress of the tunnel various kinds of shell-fish fossils are found—oysters, cockles, pipis, and whelks of many different sorts, and some now supposed to be extinct. The tunnel is about three miles from the sea, and twice as many hundred feet above it.

At the Totara Special Claim the siphon is being rapidly pushed on; about 3,200 ft. is finished and ready to be placed in position, leaving 1,800 ft. to be made. The other work in connection with this claim consists of the erection of a suspension-bridge over the Little Totara River for traffic in connection with the claim, carrying the siphon length about 150 ft., general repairs to old races purchased, and preparing for the tables, which give an area of 60 ft. by 6 ft. for copper-plates, and the same area for plush.

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OTAGO GOLDFIELDS.

Macetown.

Premier.—This mine, the property of the Glenrock Consolidated (Limited), an English company, is looking very well, and turning out gold steadily. During the year 1897 there were 3,848 tons of quartz crushed for a yield of 2,822 oz. 10 dwt. of gold, value £11,322, and gold to the value of £150 was obtained from the concentrates. Since the Glenrock Company first held an interest in this mine, in 1890, they have obtained 7,313 oz. 10 dwt. of gold, valued roughly at £29,434, from 13,058 tons, of which some 6,000 oz. has been obtained since the present manager, Mr. Walter J. Stanford, took charge of the property, embracing an area of 50 acres. During the past year a profit was made, clear of all expenses, of £2,550, and this amount has been remitted to London. At the present time fifty-nine men and boys are employed, and, besides regular work in the Premier Mine, Mr. Stanford has men engaged in prospecting the Sunrise Mine, on Advance Peak, which is considered by many to be the source of a great deal of the gold found in the Arrow River, which was at one period a very rich diggings and a scene of busy mining activity.

Westralia and New Zealand Gold Explorers (Limited).—In this company's mine (formerly known as the Tipperary) they are working on an entirely new strike of quartz in the low-level adit, with a mountain above them; but the stone now being broken down, though distinctly gold-bearing, is not very rich. During the year 1897 the mill produced 585 oz. 10 dwt. of gold, value £2,359 2s. 6d., from 1,501 tons of quartz, and from 137½ tons treated at the cyanide-works gold was obtained to the value of £546 14s. 5d.

Cromwell.

Cromwell Goldfields Company (Limited).—This company's mine at Bendigo is being worked on tribute, ten forming the party. The tributers are now working a block of stone at the 200 ft. level in the old main shaft, but travel to and from work by an adit on the line of reef. The principal shaft is some 14 chains east of the old main shaft, and connects with the reef by a cross-cut driven to the south. Here the reef is from 1 ft. to 2 ft. wide. In the worked-out ground the reef was as much as 10 ft. in width, but variable as a whole. It splits up or divides between the two shafts, and the tributers are working on the north division of the reef. The yields have been very good, the average from three crushings having been over 2 oz. to the ton, while the value of the gold obtained is £3 15s. per ounce. It is maintained that these results would be still better if more modern methods of treating the tailings were adopted, and it is safe to say that the stone from the deeper ground has a much greater assay-value than can be realised by present appliances. A second party of tributers are just about to start work at the principal shaft, where there is a lot of plant of an obsolete character, and if deeper sinking should be undertaken a new installation will be required. Superficially, it looks as if an adit from the valley below the mine would strike the reef at as low a level as the bottom of the present principal shaft. Assuming this being constructed, it would obviate 500 ft. or more of winding and pumping. The shaft could be sunk down below the adit as far as necessary, and all stone and water delivered at the adit. The water-power now driving the pumps and battery could be carried to the low level, and would then have an additional pressure of some 200 lb. per square inch Underground the Inspector found the present actual working-places quite limited in extent, and showing very good stone. The foot-walls and hanging-wall are very strong and nearly vertical as a rule, needing but little timber, while the air is very good.

Carrick Range.

The Golden Gate Quartz-mining Company, Bannockburn.—This is a private company, of which Mr. James Horn is secretary. Work has been going on here in a small way with a couple of men for two years, but recently six men have been employed. The reef lies at an angle of about 1 in 3½ from the horizontal (more like a coal seam); and is variable in thickness, the average being about 16 in. It looks suitable for long-wall working, as in coal- and ironstone-mines. A trial crushing shows a yield of 12½ dwt. of gold to the ton. Some of the stone is oxidized, and some of a whitish appearance. The former yields its gold very freely by the ordinary process of crushing and amalgamation, but the latter is refractory, and needs separate treatment. The mine is entered from an adit above the left-hand branch of Pipe-clay Creek. A small battery (two heads of stamps) has been erected, and is driven by water-power. Considerably higher up the creek there is a tunnel, in which some work was done several years ago, and it is stated that 23 dwt. of gold to the ton was then obtained. The reef is 2 ft. 6 in. thick, and lies at an angle of about 45°. This is on the present company's claim, and proposals for the development of the property will shortly be considered by the proprietors. The claim has an area of 100 acres.

Young Australia Quartz-mine.—A reef was worked here some twenty years ago by an adit tunnel, and stoped overhead, and also for about 20 ft. under-foot. This latter work caused them to be beaten by the water. A shaft was subsequently sunk, but the water proved too much for the appliances, and the ground was abandoned. It is now held by Messrs. McCabe and Sons, who have commenced an adit about 90 ft. lower than the original one. It is driven 380 ft. or thereabouts, but is now standing idle for want of funds. Mr. McCabe estimates that a distance of 300 ft. has yet to be driven to cut the reef, which is about 5 ft. in width on an average, with a dip of 1 in 3 from the horizontal, and is said to yield 1½ oz. of gold to the ton. There is a 5-stamp battery on the ground, with overshot water-wheel for driving. The object of this lower tunnel is to gain workable ground and drain the old workings into Adams' Creek. It is claimed that the drainage of the old mine would open out a lot of ground and benefit the place generally.

Roxburgh.

Ewing's Claim (formerly the Hercules Company's).—Mr. Ewing acquired this property in May last, and is now working on ground known as No. 1 Hercules. The method of working is by hydraulic sluicing and elevating. Water is brought from the Teviot Stream by two races, each being about a mile and a half in length, and largely constructed of fluming. The main pipe-line is 6,400 ft. in length and 18 in. in diameter, giving a working-head of 520 ft. This claim has rights for 41½ Government heads of water. The gold-bearing wash is 2 ft. thick on the bed-rock, and overlaid by 35 ft. to 40 ft. of drift gravels. Eight men are ordinarily employed, their time being arranged so that work is carried on for twelve hours each day. Owing to so many large stones having to be dealt with, it is not considered advisable to work through the night with present appliances. Much of the gold is fairly rough, and the claim is paying expenses. One elevator and one pumping-elevator are used, and the sluice-boxes (which are provided with riffles and matting) have a fall of from 9 in. to 7 in. per 12 ft. length.

Mount Ida.

Mining operations have been greatly hampered during the past month throughout the district owing to the want of water.

At Naseby the only race carrying any water was the Government race, and even from that source the supply was very limited, being only about a quarter of the proper quantity.

At Nenthorn, for the same reason, miners who have stone to grass ready to crush have been unable to get it put through the battery.

The two dredges on the Kyeburn have made a start, but have been unable as yet to do much. The larger dredge was built in a very inconvenient spot, and some difficulty is experienced in getting her into the river where she is to work. The smaller dredge, which was reported to be paying her way, has been stopped for some time through want of water.

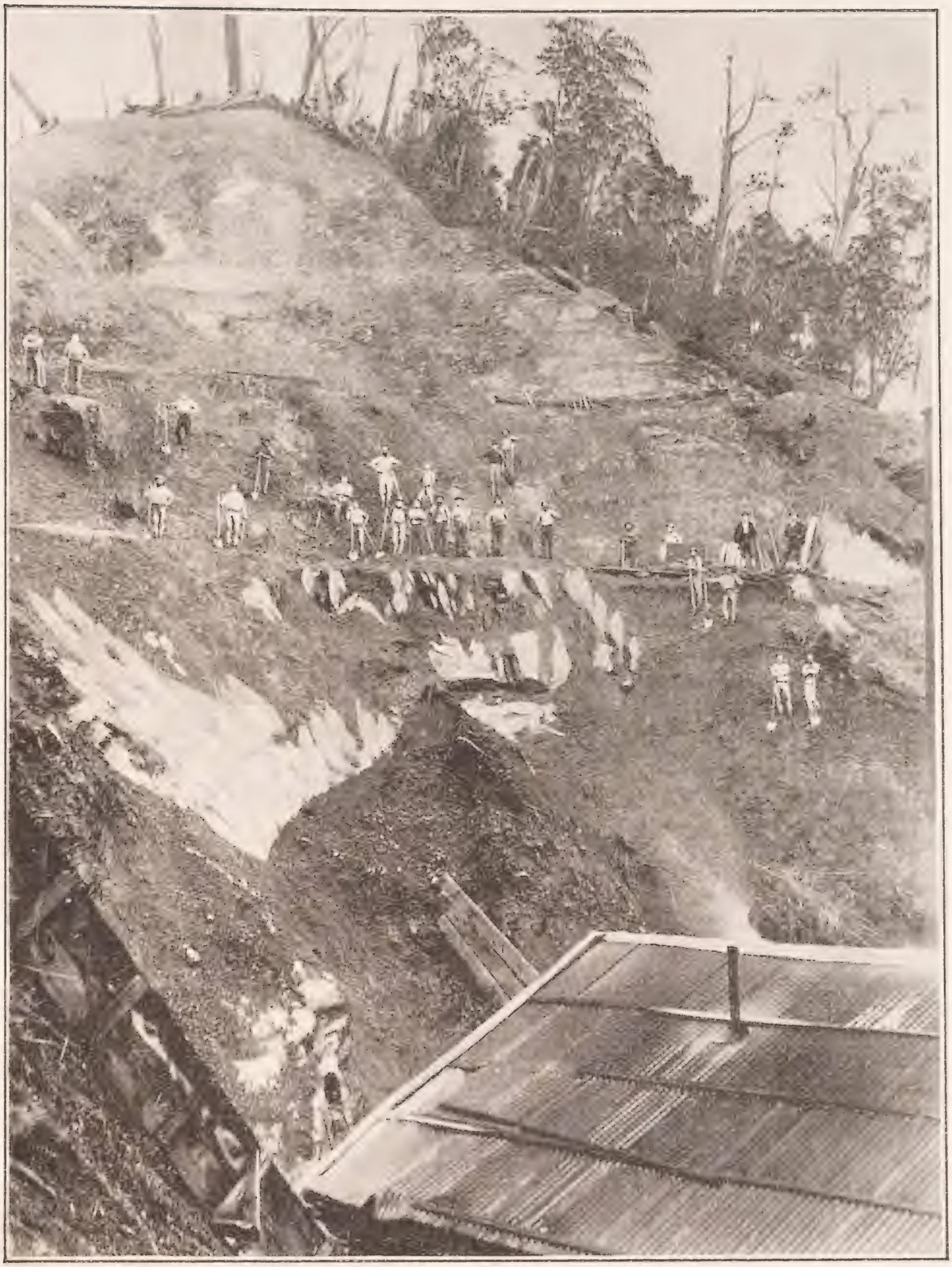
At no distant date Messrs. Guffie and party's dredge should be at work in Main Gully. The machinery has arrived in the colony, and will shortly be on the claim.

At Macrae's some slight attention has been given to the flat for dredging purposes, and several claims have been marked out, the applicants for which appear sanguine as to their speculation being a remunerative one.

Riverton.

Number of special claims and licensed holdings in force in the Riverton Warden's District (which includes Orepuki, Longwood, and Preservation) on the 31st December, 1897, showing also the total area and the rent payable:—

Number.	Purpose for which granted.	Area.			Annual Rental.		
		A.	R.	P.	£	s.	d.
33	Quartz	1,549	0	22	511	5	0
6	Sluicing	246	0	3	87	5	0
39		1,795	0	25	598	10	0



Men working on Slope—Globe New Shaft, Reefton.

There are no dredges yet at work in any of the places referred to, but there is a probability of one or two being placed on the Waiau, provided the applicants proceed with the applications now pending. In the year 1887 only one licensed holding was in force in this district.

Ourawera, Round Hill.—The results for the half-year ending the 31st December, 1897, are the best yet obtained by this company, who are sluicing on a large scale, the weather having been favourable for their operations, which were fully described in the September and October issues of the *Record.* Gold representing £1,442 8s. 7d. was sold, out of which the shareholders received £320 in dividends. The working-expenses for the six months are set down at £764 9s. 3d. The value of the claims, plant, water-races, reservoirs, and tools owned by the company is estimated at £2,267 18s. 6d.

COAL-MINES.

The following is the output of coal from the West Coast coal companies' mines during the quarter ending the 31st December, and the amounts paid (at the rate of ½d. per ton) to the credit of the Miners' Accident Relief Fund at the post-office :—

Name of Company.	Tons	cwt.	£	s.	d.
Denniston	45,035	8	93	16	5
Millerton	10,949	10	22	16	3
Cardiff	12,633	0	26	6	0
Brunner	20,306	12	42	6	1
Blackball	12,896	0	27	1	1
Totals	101,890	10	£212	5	10

There was a decrease in the output compared with the preceding quarter of 8,334 tons 6 cwt., and in the amount paid to the accident fund of £17 8s. 1d.

The following are the exports of coal, timber, and sleepers from the Port of Greymouth during the year 1897 :—

	Coal. Tons.	Timber. Sup. ft.	Sleepers. Number.
January	10,524	264,437	10,781
February	10,967	640,452	2,485
March	7,976	750,811	6,235
April	6,249	965,225	250
May	8,804	997,463	4,599
June	12,852	1,097,571	4,474
July	10,190	653,439	8,597
August	13,207	1,022,467	13,785
September.. ..	7,145	582,551	7,669
October	9,251	759,317	5,445
November	8,408	601,930	2,679
December	13,080	851,637	10,322
Totals ..	118,653	9,187,300	77,321

The exports from the Port of Greymouth for the past month included 8,381 tons 15 cwt. of coal, 412,845 superficial feet of timber, and 4,895 sleepers.

VISIT OF GOVERNMENT GEOLOGIST TO VICTORIA RANGE AND BOATMAN'S.

Report on the Auriferous Rocks of the Western Slopes of the Victoria Mountains,

INANGAHUA VALLEY, NELSON.

SIR,— Wellington, 31st December, 1897.

As directed, between the 15th and 23rd instant I visited and partly explored the western slopes of the Victoria Mountains, and made an examination of the area of loose auriferous quartz on Kirwan's Hill, and of several lodes in the same vicinity, on which I have the honour to report as follows :—

Report.

The discovery on the northern slope of Kirwan's Hill of a considerable area over which are strewed a covering of loose blocks of auriferous quartz has led during the past season to a great amount of prospecting there, in the vicinity and surrounding district. The result has been the discovery of numerous reefs of quartz within the area lying between the upper part of Larry's Creek and the upper part of the Waitahu or north branch of the Inangahua River. Of the reefs found, none of them as yet afford prospects of gold equal to what are to be obtained from the loose quartz on the northern slopes of Kirwan's Hill. This loose quartz occurs in blocks of all sizes up to masses 2 to 3 tons in weight, and thickly covers the surface over an area of 10 or 12 chains in length, with an average breadth of 4 or 5 chains. The quartz is chiefly, if not wholly, confined to the surface, although masses of the wrecked hill-slope do here and there show portions of reefs held within walls of sandstone and slate rocks identical with the general formation of Kirwan's Hill and the country eastward to Capleston.

Towards the lower end of the quartz-covered area, and where the stone was richest in gold, a tunnel has been driven west into the hill, in the hope that by this means solid ground might be entered, and the lode from which the richer quartz has been derived thus discovered. At a distance of 150 ft. from where started the tunnel driven west into the hill failed to reach solid rock, and no reef was discovered ; yet, more remarkable, scarcely a fragment of quartz was found more than 3 ft. below the surface in the tunnel workings. At the present time, at the opposite northern end of the field of quartz, a shaft is being sunk to prove the depth to the solid rock, and this shows the same remarkable absence of quartz from all but the very surface of the *débris*-covered mountain slope. This shaft, when visited, had reached a depth of 35 ft., and had not passed through the broken angular material met with in the tunnel lower down the spur.

On the north-eastern part of Kirwan's Hill, and in the ridge thence going east and north-east to connect with Trig Hill, there are numerous reefs that strike S.S.E. and dip E.N.E at high angles, and thus should pass but a little to the eastward of the field of loose quartz on the northern slope of Kirwan's Hill. It must, however, be noted that on the north and north-north-west higher part of the hill no notable discovery of quartz has been made (none were reported to me), and westward, along the road leading to the upper part of Boatman's Creek and Capleston, in the side-cuttings of the road rarely is a piece of quartz to be seen.

All the lodes of quartz found are poor in gold compared with the richer of the loose blocks of the quartz-covered surface on Kirwan's Hill, and some would seek to refer the latter to a distant source, and consider that the lodes and the field of loose quartz on the surface are only in accidental juxtaposition. After due consideration of this matter I have come to the conclusion that the loose quartz is derived from lodes in the immediate vicinity, and the evidence in support of this conclusion fully bears out the decision arrived at.

Wherever matrix adheres to the quartz, this, as forming part of the foot- or hanging-wall of the original lode, is of the same character as the foot- and hanging-walls of the lodes that have been discovered. The quartz also closely agrees with that of the lodes found, and the correspondence is complete in all except the amount of gold which is contained in the loose and solid stone.

All the rocks of Kirwan's Hill and the adjacent ranges to the north and north-east are slates and sandstones belonging to the Maitai series of the New Zealand Geological Survey Classification. Outside there are the Victoria Mountains to the east: the rocks are granites and crystalline schists, and from the absence of a trace of these on Kirwan's Hill it is not possible that the loose quartz of the northern slope of Kirwan's Hill could have come from these mountains nor from an eastward direction; nor could the material of the quartz-field have come from the west without at the same time being accompanied by granite from the lower beds of the coal-measures and dark hornblendic diorite from a heavy band of that rock that outcrops on the slope from the higher part of Kirwan's Hill to the source of Boatman's Creek.

The rich quartz that is found on the surface of the Lord Brassey Claim has, therefore, in all probability, been derived from a lode not now seen at the surface, and which probably will be found running along the eastern part of the claim mentioned. More to the westward for a considerable distance there is little indication of the presence of quartz reefs.

The whole belongs to the eastern system of quartz lodes found in connection with the Maitai slates stretching along the east side of the Inangahua and Little Grey Valleys, from the source of the Blackwater in the south to the gorge of Larry's Creek in the north.

The slate between the Waitahu and Larry's Creek extends considerably east of the boundary hitherto assigned it, and towards the upper part of Larry's Creek there is a large area over which prospecting might be carried on with a fair show of success.

ALEXANDER McKAY,
Government Geologist.

The Under-Secretary for Mines.

Report on the Auriferous Character of Boatman's Creek,

BELOW CAPLESTON, INANGAHUA.

SIR,— Wellington, 31st December, 1897.

In accordance with your instructions, dated the 17th December last, in which I was directed to report on the geological features of the valley of Boatman's Creek, between Cronodon and Capleston, I have made the examinations required, and have the honour to submit the following report relating to the district above referred to:—

Report.

Boatman's Creek has been worked for gold from Capleston upwards to the junction of the two main branches of the principal stream, and Little Boatman's Creek has been worked to its source in Specimen Hill. The amount of alluvial gold thus obtained was considerable. The gorge of the creek has been cut many hundred feet into rocks traversed by auriferous quartz lodes, from which much gold has been liberated and carried to various distances down stream.

At Capleston the slates and sandstones carrying quartz lodes are overlain by the coal-bearing series, at the base of which are grit and conglomerate beds that are to some extent gold-bearing. At the lower end of the township the coal series is followed by heavy deposits of conglomerate and coarse gravel, locally known as "Old-man bottom." These gravels form hills on both sides of the valley to within a short distance of Cronodon, and over a width from a quarter to half a mile a depth of 300 ft. to 400 ft. has been removed in the formation of the valley of the creek.

Gold occurs in the lower beds of the "Old-man bottom," and again at a horizon some 60 ft. higher in the formation; and farther down the valley, on Boardman's property, a third horizon of gold-bearing wash is found. The recent alluvial deposits along the valley below Capleston should therefore contain gold derived—first, from reefs in the slates and sandstones of the Maitai series; second, from the base of the coal-bearing formation; and third, from two or three horizons in the "Old-man bottom"; and it is only on account of the wet character of the ground that gold workings have not been essayed in that part of the valley west of where the coal-rocks in the low grounds disappear under the gravels of the "Old-man bottom."

The question of the auriferous character of the gravels constituting the "Old-man bottom" has been dealt with in the report containing the description of the blocks reserved for mining purposes (Mines Reports, 1896, C.–9), and Block LIII., within which is situated the part of Boatman's Creek forming the subject of this report, is described at page 4 of the report in question (*q.v.*).

That portion of the valley of Boatman's Creek which is under consideration has a creek-channel of moderate width, in and along which lies a considerable amount of drift timber. The banks are bare, and the flat ground intervening between the water-course and the hill-slopes are covered by standing timber or tree-stumps, and the presence of these will compel the adoption of special methods of working the auriferous deposits that underlie.

As bearing on the matter of this report might be raised the question of the auriferous character generally of the "Old-man bottom." This has been dealt with sufficiently in the introduction to the description of the blocks reserved for mining purposes above cited, and in the reports for the year 1895, for which see Mines Reports, 1895, C.–13, "On the Geology of the South-west Part of Nelson and the Northern Part of the Westland District."

Alexander McKay,
Government Geologist.

The Under-Secretary for Mines.

(Extracts from Introduction to "Report on the Mining Reserves within the Northern District of Westland and the Buller and Grey Valley, Nelson," by Mr. H. A. Gordon, F.G.S., Inspecting Engineer, and Mr. A. McKay, F.G.S., Government Geologist; Mines Report, C.–9, 1896.)

In order to guide us in forming an estimate as to the future working on mining reserves—of mining on blocks on which the form of mining was mainly alluvial—we had to regard the past history and present condition of mining on each block; and the different classes of alluvial workings had to be discriminated, from the fact that some forms of alluvial mining are likely to have more permanence than others; and some, strictly speaking, alluvial deposits, workings in which could not be regarded as alluvial workings in the ordinary sense of the word, had also to be considered apart, they being cement workings, in some cases requiring to be mined from beneath a considerable thickness of superincumbent strata, or, as in others, forming widespread formations of great thickness and considerable age, from the denudation of which have been derived the more modern auriferous gravels that lie along the valley bottoms of the different watercourses intersecting the area of such older gravel formations.

In discriminating thus between alluvial deposits of different ages and diverse conditions with respect to their origin, fluviatile or marine, it necessarily followed that the general geological condition of the whole region, or of distinctive parts of it, had to be considered, and the review necessarily carried us back, in time, not only to the period of the deposit of the earliest and first-formed beds of the coal formation, which are gold-bearing, but also to make the attempt to determine a period anterior to that of the coal formation during which the reefs in the Maitai series were formed, but more especially, because of greater importance, a subsequent period during which the formations containing quartz reefs were disturbed by upheavals and dislocations that render the following of lode-fissures very often a matter of great difficulty. We had in one or other of these connections also to consider the general tendency of the drift of the alluvial gold-bearing formations, and the probable source from which the gold had come, and thus through knowledge gained by a study of the hysteromorphous deposits to trace the original source of the gold, or to determine whether a particular area or mountain-range might reasonably be regarded as containing auriferous-vein deposits.

Consideration of all these different subjects was at times, and from time to time, forced upon us, and to a right understanding of the evidence leading up to the conclusions we have arrived at it is needful that the salient features of this should be given to show the grounds on which these conclusions rest.

The oldest quartz lodes within New Zealand occur in Silurian strata, and were denuded in part prior to the deposit of some parts of the Te Anau series, there being thick beds of quartz conglomerate (vein quartz) in that formation near the source of the Baton River, in the north-west district of Nelson. The most productive auriferous reefs that occur on the west coast of the Middle Island are found in the rocks of Maitai series of Carboniferous age, and these were infiltrated or formed prior to the deposit of the great sequence of formations including deposits, both of Permian and of Upper Jurassic age, that were laid down during a period of quiesence that continued from the close of the Palæozoic period to that of the Middle Secondary period.

The conglomerates belonging to the different formations of the Middle and Older Secondary sequence are not distinguished by the presence of quartz in them, and it is therefore probable that the reef-forming period was at the latter date indicated. This is rendered the more probable since, though it is generally considered that the Maitai series was upheaved and partly denuded before the Permian formation began to be laid down as above indicated, it does not appear that the beds were very greatly disturbed, fissured, or mineralised.

Subsequent to the deposit of the highest beds of the Middle Secondary series—the Mataura series of the New Zealand Geological Survey—there was a considerable period during which no important formation was laid down within the New Zealand area, more especially within that of the Middle and South Islands. There is evidence of the existence of high land during the interval between the deposit of the Mataura series and the formation of the lower beds of the Cretaceous and Cretaceo-tertiary series, of the crumpling and involvement of strata, and the probable consequent production of fissures that in time were filled with mineral matters in part metalliferous. This action was more pronounced in the middle and northern parts of the Middle Island than in the southern part, or in the middle and northern parts of the North Island, the Middle and Older Secondary sequence not being greatly disturbed in Otago and Southland, nor on the west coast of Auckland in the North Island. In Canterbury and south-east Nelson the same beds are greatly disturbed and deeply involved as structural rocks on the eastern slopes of the chain of the Southern Alps. On the west coast of the Middle Island there are no Middle or Older Secondary rocks preserved, and consequently no evidence of great disturbances during the interval between the deposit of the Jurassic and younger Cretaceous formations of New Zealand.

The Older Secondary sequence was probably deposited over the area of the West Coast and afterwards completely removed by denudation. This was effected prior to the deposit of any considerable part of the coal-bearing formation. This assumption is supported by the fact that the rocks referred to were at the time widespread over the areas of the east coast of the Middle Island and the west coast of the North Island. There are no grounds for assuming that a barrier existed preventing their continuous deposit in a north-west direction, so as to cover the region of the West Coast. But it is not pertinent to our present inquiry, nor at all necessary to the things we would advance, that these rocks were ever present on the area of the West Coast, the condition of which during early Cretaceous time we shall endeavour to describe. What is more particularly insisted upon is the existence of an elevated mountain tract coextensive with, and probably far exceeding, the area of the West Coast at the present time.

The rigid, abrupt, and unequal character of the surface is indicated by the nature of the material, the proceeds of denudation, that has been preserved, and now form the lower beds of the coal-bearing series. That a mountain region covered with perennial snows and supporting large glaciers reached into and carried immense loads of material to the low grounds is shown by the vast accumulations of very coarse, angular, and partly-rounded material that at many places form the lowest beds of the coal-bearing series. There are three great areas of such deposits within the district of the West Coast presently under consideration; the first and better known, also the most extensive, is that which extends along the Buller Valley from the Ohika-iti River to Grainger's Point, in the Lower Buller Gorge, and having thus an extension east and west of fully eight miles, it in the opposite direction has a breadth of four or five miles. Though a local deposit it was probably at the time it was laid down much more extensive than at the present. It consists throughout of angular detritus, in some parts of moderate size and of extreme regularity as regards both size and material. At other places the material is coarse, with the frequent occurrence of large angular blocks of granite, some of which are of very great size. The beds at Grainger's Point are the lowest in the sequence; shales, sandstones, and well-rolled conglomerates, and one or two thin seams of coal separating these from the higher and coarser breccias of Hawk's Crag. These latter rise into mountains that reach a height of 2,500 ft. above sea-level, and are composed of angular brecciated material throughout. The formation is largely developed on both sides of the Buller Valley within the limits described.

The second considerable area of exceedingly coarse and angular matter lies between Moonlight Creek and the left branch of Big River, and, on the north-west side of the Grey Valley, forms the lowest beds of the coal-bearing series. The beds pass under the coal-seams and associated finer measures that stretch across this part of the Paparoa Mountains to the low grounds on the western slope of the same. On the south-east slope of the range the coarse breccia beds have a very great development, and in the main the material is of an exceedingly coarse description, angular blocks, reaching an amplitude 10 ft. or 12 ft., being of frequent and quite common occurrence in the valley of Black Sand Creek. It requires but a cursory examination of these beds to be convinced that they could have originated in no other way, or reached their present position by other means, than the agency of ice. Large quantities of granite as boulders are included with other rocks to form this Slaty Creek or Big River deposit.

The third principal area of coarse brecciated material lies along the valley of Boatman's Creek, on the east side of the Inangahua Valley. This in many respects resembles the deposit in the Grey Valley, which has just been described, but the material is yet of greater dimensions and quite as angular in character. There is also perhaps a greater proportion of granite in the brecciated mass, which as a range of mountains strikes across the valley of the upper part of Boatman's Creek, and extends south to the valley of the north branch of the Inangahua River. This deposit presents in the gorge of Boatman's Creek a most remarkable appearance, and is convincing beyond all dispute as to the agent concerned in its production.

Along the east side of the northern part of the Mount Davy Range there is a considerable development of coarse breccias that stretches along the lower slopes of the range to the south, rises to higher levels, and passes into heavy beds of more rounded gravels on the south-east face of Mount Sewell, and thence descends to lower levels towards the upper end of the Brunner Gorge. At Charleston, and at the mouth of the Fox River, lesser and more local deposits of the same kind are met with.

These coarse and brecciated beds are at most places followed by well-rolled conglomerates, composed of a mixture of sandstone and quartz pebbles, but at many places the material is moderately small and well rounded

—as, for instance, on Mount Davy and along the east side of the Inangahua Valley, and by a mixture of sandstone and quartz pebbles in the Upper Buller Valley. These beds are more widespread than the underlying breccia conglomerates, and consequently often rest directly on the underlying unconformable formation of older date.

Coal-beds and brown sands, or dark-coloured mudstones, overlie, and these also overlap the preceding members of the same series, and at places rest directly on the older rocks. Limestones succeed, and in like manner these also, at places, rest on the older slates that underlie the lowest members of the series.

All this shows that the accumulation and deposit of the lower beds of the coal-bearing series was made from a high and irregular surface, capable of producing and feeding glaciers that reached into the lower grounds where were deposited the proceeds of a violent and rapid denudation of the higher elevations. The succeeding rocks, consisting of conglomerates and quartz grits, give evidence of the action of water, and more complete grinding and assortment of the material denuded from the high lands; also of a tendency to a lowering of the general average height of the country, either by denudation itself, or that combined with depression, which sinking of the land gave the opportunity for the spreading of the latter proceeds of denudation over a wider surface, and in like manner each succeeding member of the series overlapped, till the country—the amount of denudation gradually lessening—eventually was submerged wholly or in greater part, and the chalky limestones, the last of the great series of deposits, was spread over the entire area of the west coast of the Middle Island, from Ross to the Owen River, and from Charleston to the Maruia and Matakitaki Valleys.

It becomes necessary now to consider the auriferous character of some of the different members of this great series of younger Secondary and Cretaceo-tertiary rocks. It is well known that they are auriferous to a degree that should pay for working in the vicinity of Reefton, and along the east side of the Inangahua Valley. (This fact will be more particularly adverted to when describing the different blocks within which such auriferous quartz drifts are found.) At the present time it is proposed to prospect the lower beds of the series at Charleston, with a view to the discovery of gold which is believed to exist in them there, and at the mouth of the Fox River.

On the coast-line, farther to the south, between the Twelve-mile and the Seven-mile Creeks, north of Greymouth, there is a very great development of a mixture of sandstone and quartz gravels, and every evidence that at places these are gold-bearing. Here, also, they are regarded as being stanniferous, tin stones having been found between the Ten-mile and the Twelve-mile Creeks under circumstances that strongly support this inference.

In the Grey Valley the gold found in Langdon's and other small mountain streams coming from the east slope of the Mount Davy Range is in part referable to this source, and the source of the bulk of the gold found in Ford's Creek is inexplicable, unless it be referred to the breccia conglomerates at the base of the coal-bearing series, and the quartz conglomerates and coarser grits that overlie the breccia conglomerates throughout this part of this mountain-range that lies between the lower Grey Valley and the coast-line.

With respect to the auriferous character of the Hawk's Crag breccias, nothing is known with certainty, the only evidence being that certain prospectors found gold in the valley of the Blackwater as far as these breccias continued up the valley, but on passing these and entering upon the gneissic rocks of the higher part of the Paparoa Range the gold gave out and could not be traced any further.

In the Upper Buller Valley gold is known to occur in the conglomerates at the base of the coal-bearing series, both above and below the lower coal-seams, and as there is here a great development of these conglomerates in the Maruia Valley, in the Matakitaki and Glenroy Valleys, and in that of the Mangles River, it does seem to us that these conglomerates will shortly be the means of a revival of mining in that district. Fuller evidence of their auriferous character will be given when describing the different reserves made within the Upper Buller Valley, within which these auriferous Cretaceous gravel or cement beds are situated.

The facts of the case being as above stated, it will therefore be apparent that the auriferous reefs found in the Maitai series had been already formed, and that they suffered in the denudation that preceded the laying-down of the earlier-formed members of the coal-bearing series on the west coast of the Middle Island; and, without attempting to argue in a circle, this should be manifest from the fact that a great denudation of these beds did take place, and that the proceeds of such denudation is auriferous.

Prior to and during the deposit of the Cretaceous and Cretaceo-tertiary or coal-bearing series, the Maitai rocks, it may be presumed, were not disturbed to the degree in which we now find them. Certainly a great disturbance took place subsequent to the formation of the reefs and the introduction into them of the gold. This may be proved in various ways: Firstly, and most directly, by the broken and dislocated character of the reefs in the condition in which they are now being explored; and also by the fact that the gold is often (due to movement of parts of the reefs) twisted, striated, and slicken-sided—characters that necessarily are exhibited in the greater mass of the lodes themselves and of the adjoining rocks.

Throughout the Grey and Buller Valleys there is abundant evidence to show that this great disturbance of the auriferous Maitai rocks took place subsequent to the deposit of the highest member of the Cretaceo-tertiary series, and probably at a considerably later date, or towards the close of the Miocene period. There may have been an elevation and a subsequent sinking of the land during the Eocene period, but on the west coast of the Middle Island there are no evidences supporting this assumption, the unconformable relations of the Cretaceo-tertiary and Miocene rocks not having been satisfactorily determined or fully worked out. On the opposite coast, and in the southern part of the Island, it is thought by some there was an upheaval of the land in the interval between the Lower or Middle Eocene period and that of the Lower or Middle Miocene period. But whatever the evidence may be, and whatever the amount of elevation induced, this did not suffice towards the production of any marked degree of unconformity between the Eocene deposits of the northern and central parts of the Canterbury District, or of north-eastern Otago, where only Eocene deposits are supposed to be found. Much and more marked disturbance of the strata of these districts took place at a later date, whereby even the Miocene rocks on the east side of the Southern Alps were elevated considerably above the level of the sea, and at the same time were deeply involved, with other and older rocks, along the eastern slopes of the Southern Alps; and in the Amuri and Marlborough Districts even younger rocks are found deeply involved along the lower slopes of the Kaikoura Mountains.

As therefore there is little to support the assumption of any serious disturbance taking place between the middle of the Eocene and Miocene periods, it is to the latter part of the Miocene period and the commencement of the Pliocene that the movements that did take place are to be referred. Therefore during the whole of the period between later Jurassic and late Miocene times we have to assume that the Maitai rocks were not protected from the forces of denudation in the manner that they are at present, and consequently that during the period of the deposition of the lower beds of the coal-bearing series they were greatly eroded and yielded large quantities of gold to the gravels of that formation.

During the latter part of the Cretaceo-tertiary period, or while the Amuri and Cobden limestones were being deposited, there was depression of the land within the New Zealand area to such an extent that the higher calcareous members of the formation being deposited were laid down continuously over the whole of the northern part of the Middle Island. The depression might have been less during Eocene times, but a great part of the area continued under the sea up to about the middle of the Miocene period, when a rapid elevation of the southern area of New Zealand began, accompanied by flexures and crumplings of the strata subjected to movement.

Before the close of the Miocene period high land was in existence, and a rapid denudation of this was being effected; and now commenced the accumulation of the great series of gravels that are found on both coasts of the Island and in Central and Southern Otago, locally known by different names, such as "Maori bottom," from the brown colour of the beds exposed at or near the surface; "Terrace bottom," from Brighton Terrace, near Kanieri, on the Hokitika River; "Old-man bottom," as being a sort of "farewell rock" of the alluvial gold-miner. By the Geological Survey the series is called the "Moutere gravels," from the fact that the Moutere Hills, Spooner's Range, and large areas within the adjoining Motueka Watershed are formed of these gravels, which are variously regarded as being of Upper Miocene or of Older Pliocene date. As the land increased in height, and watercourses were determined upon its surface, one principal line of erosion would appear to have been, approximately, a line drawn from the mouth of the Mikonui River to the sinking of the Moutere Hills to Blind Bay, in the Nelson District. The depression along which these gravels accumulated may be considered as in part due to movements, and in part due to erosion of the land; but however effected it is clear that indications of two distinct systems of mountains began to appear towards the north-east, these tending to coalesce with each other as they were followed to the south-west. This is even now evident in the approximating parallel, but slightly convergent, ranges of the Spencer Mountains, and of the main range farther to the southward on the one side of the depression, and of the Collingwood, Mount Arthur, Merino, and Lyell Mountains, Papahua and Paparoa Mountains on the other side. South of the Grey Valley this western line of mountains are ended; but it is easy to imagine their continuation in a southerly direction till the range, or system of ranges, made junction with the eastern line in the region where Mount Cook now stands.

There is evidence that a valley depression was continued to the south-west as far as Ross and the mouth of the Mikonui River, where the river-gravels of the "Old-man bottom" are now some 300 ft. below the level of the sea. It is generally admitted, and we hold the opinion, that from Ross to Reefton the "Old-man bottom" is practically the same and one continuous deposit. The gravels of the "Old-man bottom" were therefore supplied from both the eastern and the western ranges; and in the south it may have been principally from the western ranges now disappeared below the waters of the sea.

With or immediately following on the elevation of the lands to heights that could be rapidly denuded by atmospheric agents there commenced a series of movements involving crush and fracture of the rocks upon a large scale, oft repeated along certain determinate lines of displacement, till by this means the more superficial rocks were lowered or caught between masses of older rock, and so protected were preserved. In this way areas of Maitai auriferous slates have been preserved between gneissic and other older rocks, and, in like manner, the Maitai rocks have protected and preserved outlying patches of the coal-bearing series, both at Reefton and in the Grey Valley. This is shown by the manner in which the Maitai series and the coal-rocks are in contact along the east side of the Mount Davy Range, and by the manner in which the Maitai rocks are in contact with the gneissic rocks of the Paparoa Range, near the source of Moonlight Creek. And, again, the same thing is exemplified in the Reefton district, and in the gorge of the Buller at and above the Lyell. In these movements the quartz reefs suffered dislocations and displacements that affected them vertically as well as in a horizontal direction. A study of the movements affecting the coal-rock along the upper part of Murray Creek, and in the range to the eastward, will clearly indicate what the effect of crush and movement has been in the country-rock and auriferous reefs of the neighbouring Maitai series.

The gravels of the "Old-man bottom" were now deposited and extended in one unbroken sheet from Ross to Reefton; they also filled the greater part, probably the whole, of the Inangahua Valley. They covered the low grounds of the northern part of Westland from the foot of the granite ranges to what is now the sea-coast; and, by way of Big River and the sources of Antonio's Creek, they extended farther to the north-east than at the present time they can be traced. Whether at any time the deposit was continuous and connected with the extensive area of the same gravels in the district south of Blind Bay is perhaps matter for debate. In a previous report* Mr. McKay seems to assume that they are continuous across the upper valley of the Maruia, Matakitaki, &c., and of the Buller itself, into the Motueka Watershed. In this matter he has been misled, since the conglomerates in the Upper Maruia, Glenroy, and

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* Geological exploration of the northern part of the Westland Goldfields and Mining Reports, 1893, p. 132.

Matakitaki do not belong to the Pliocene, but to the Cretaceous or Cretaceo-tertiary period, and, as has been noted, are found associated with the coal-bearing beds of that part of the district.

We, however, determined the presence of the "Old-man bottom" in the district around Merrijigs at such elevations that the gravels belonging to this formation might very well at one time have extended into the Upper Buller Watershed; and their absence in that part can easily be explained on the assumption that a somewhat greater elevation took place locally in this part, which favoured a great activity of denudation, and, as a consequence, the entire removal of the gravels in question.

Upheaval of the land was general, and continued throughout the early part of the Pliocene period, till elevations were reached that induced the accumulation of perennial snowfields, which finally had to be relieved of their excess of snow by glaciers, which, reaching into the low grounds, accumulated morainic matter over surfaces already occupied by gravels of the "Old-man bottom." Evidences in proof of this are to be met with at Ross, in Mont d'Or, in the upper part of Orwell Creek, in Napoleon Hill, and in the head of the left branch of Noble's Creek, and at the source of Duffer's Creek, and, to a less degree, along the south-east side of the Little Grey Valley as far as Antonio's Flat and Slab-hut Creek. These evidences consist in the presence of angular and very coarse breccia-gravels, containing masses of rock that are quite angular and of such great size that it would seem that no agency other than that of ice could reasonably be supposed concerned in their transportation from the mountain region to the places where they are now found. In the left branch of Noble's Creek examples came under our notice that were 10 ft. to 12 ft. across and about the same in thickness. The glaciers, and afterwards the rivers in altered courses, cut down and removed the gravels of the "Old-man bottom" from the foot and for three or four miles to the west of the granite range between the Big Grey and Lake Brunner, and at the same time, or subsequently, from the country drained by Snowy Creek.

Great changes in the physical outlines of the country began now to be effected, principally through the formation of gigantic faults, which lowered the country along particular lines, disturbing and altering, or completely obliterating, former lines of drainage, and substituting for a general north-east and south-west direction of the drainage a more westerly and direct course to the present sea-board. This was favoured by the disappearance of the western mountains south of the present mouth of the Grey River, and the Buller, the Grey and Teremakau, the Arahura and the Hokitika—all of them formerly affluents of the great river that collected, carried forward, and deposited the gravel of the "Old-man bottom"—now assumed independent courses, courses as direct to the sea as circumstances would admit of. The results were that at many places the gravels of the "Old-man bottom" were trenched across, cut down, and carried away, and at others, at a later date, covered up and obscured by glacier deposits that, due to a further elevation of the land, especially along the axis of what are now the Southern Alps, produced glaciers that invaded the lower grounds of the sea-board along the valleys of the Mikonui, Hokitika, Arahura, and Teremakau.

These new main drainage-channels favoured—or rather necessitated—the establishment of lesser streams along minor valleys, which, with their several tributaries, cut deep into the gravels of the "Old-man bottom"; and in process of time even the least important of these cut deeply into the plateau-like area which they drained, and carried away immense quantities of gravel into the main drainage-channels, which in turn were carried to the sea-board by the rivers, or arranged by them as massive terraces along their lower courses. In time the flat-terrace surface of the area over which the "Old-man gravels" extended were sculptured into hills and valleys, while along the lower grounds of the valleys were accumulated gravels, the concentrates of a much vaster amount carried away, which still retained such a percentage of the gold originally in, and washed out of, the older gravels that, on the advent of the gold-miner on the West Coast, these deposits proved to be amongst the richest of the class designated "creek-workings." At the same time it was discovered that the higher beds of the "Old-man bottom," which immediately preceded the deposition of, and partly were formed by, the glacier or sub-glacier deposits first above mentioned, were also auriferous enough to pay for working *in situ*, more especially in the district between the Arnold and the Big Grey Rivers; and of this class the workings in Napoleon Hill have long been famous. Further to the south, between the Arahura and the Kanieri Rivers, in the "Old-man gravels" some of the richer strata of the Humphrey's Gully Range were worked by being "driven out"; but now the entire face from top to bottom is being worked by hydraulic sluicing.

Further south, at Ross, in Mont d'Or, the upper morainic parts of the drift are not considered gold-bearing, but the gravels which underlie this drift are known to contain gold, and it is from this part of the deposit that the Mont d'Or Company obtain the greater part of the gold that comes from their claim.

In the Reefton district the middle portion of the "Old-man gravels" are auriferous, and are worked between the head of Soldiers' and Devil's Creeks, within the Devil's Creek Watershed. At Boatman's this is also the case, and there also the lower beds are auriferous, as will be further and more particularly detailed when describing the gold-workings on the different reserves.

The area over which the "Old-man bottom" extends is shown on the map accompanying, and it must be at once apparent that within this lie a very great proportion of the digging centres within the Grey Valley. This is less marked further to the south, for the reason not that the gravels of the "Old-man bottom" are unproductive, but on account of other sources of gold, on the sea-beaches, in raised marine terraces, and in glacier drifts.

The gold found in the marine terraces along the coast-line, or near it, and on the beach itself, can, a good deal of it, be correctly referred to the gravels of the "Old-man bottom" as a source, though not the primary source, from which it has been derived.

The terraces along the larger rivers—for instance, those between the Big Grey and the Big River—it is presumed, contain no little gold derived from the destruction of the gravels of the "Old-man bottom"; and it is only along the belt of slate, from Coal Creek to Big River, along the east side of the Inangahua Valley, and the south-east side of the Little Grey Valley; in the Paparoa Range, from the source of Moonlight to Langdon's; at Bell Hill; at the Seven-mile Creek, in the

Taipo Valley; in the Arahura, and in the Totara and Mikonui Valleys — that gold is obtained as directly liberated from its matrix in the rock-formation in the central and southern parts of the district examined, and in the Alford and Glenroy Valleys and Lyell Creek in the Upper Buller district. What further information necessary to a right apprehension of the subject we have dealt with in the above will be found in the description of the reserves made.

* * * *

Block LIII.

This is of irregular outline, and towards the west embraces—first, the country east of the main road between Larry's Creek and Boatman's, and, secondly, excluding an area of freehold land extending along the south-west side of Boatman's—a considerable area lying between Boatman's Creek and the Waitahu or north branch of the Inangahua River. The back boundary is formed by part of the line Trig. H H to Trig. G, and part of the line from Trig. G to Trig. N. The total area is 9,000 acres. Naturally the block is divisible into two parts—first, that lying between Larry's and Boatman's Creeks; and second, that between Boatman's Creek and the north branch of the Inangahua. Over that part between Larry's and Boatman's Creeks there are extensive gold-workings in Little Boatman's Creek, Burke's Creek, Ryan's Creek, and Italian Gully, more especially in the latter. In Italian Gully the main area of workings are continuous for about a mile along the valley, and are workings in recent mountain wash brought down from the range to the east, which consists of slates and sandstones of carboniferous age, referable to the Maitai series of the New Zealand Geological Survey. This is evidence that between Specimen Hill and the different quartz claims at Larry's the auriferous slates are continuous on the range. They are seen to extend across Italian Gully to the western part of the slate area at Larry's, between which two places the slates are seen to be directly overlain by the older Pliocene gravels forming the "Old-man bottom." Below the junction of Burke's Creek with that of Italian Gully the gold-workings are on "Old-man bottom."

The rocks in Burke's Creek are partly limestones, sandstones, coal-measures, and the conglomerates underlying the last mentioned, resting on the auriferous slates of Specimen Hill, and, with the next-succeeding member of the coal-bearing series, are overlain by the gravels of the "Old-man bottom." On the tops of the spurs between Burke's Creek and Boatman's Creek, and the lower part of Italian Gully and Boatman's Creek, there is reported to be gold-bearing gravels. These may be a rewash of the "Old-man bottom," or may be strata more auriferous than is commonly the case interbedded therewith; probably the latter is the case. In the upper part of Burke's Creek heavy beds of gravel, forming part of the Older Pliocene series, have been mined in Howell's claim, and a very deep face is there exposed, which has been extensively worked.

Little Boatman's has been worked from the slopes of Specimen Hill to or almost to its junction with the main branch of Boatman's. Mainly its gold has been derived from the adjoining auriferous slates to the eastward, many rich reefs lying in that direction, though these have not been traced through the spur into the valley of Little Boatman's, nor at lower levels under it. Rich specimens are, however, met with in the creek, and one large block of quartz lying in the creek-bed was found so impregnated with gold that a great part of it has been removed as specimen stone. On the north side of the valley of the main branch of Boatman's Creek alluvial-gold workings at low levels have apparently been exhausted, but on the higher slope of the hill, at the back of the township (Capleston), rich gold has been found in the lower beds of the "Old-man bottom." And from information afforded by Mr. Rodgers, of the Crown Hotel, Capleston, it appears that along the contact between the "Old-man gravels" and the coal-rocks the lower part of the auriferous band gave gold at the rate of 1 dwt. to the dish, and the upper part at the rate of 1 dwt. to the ton. It may be assumed that the deposit will extend considerably along the contact of the two rocks under the higher part of the range, striking towards Howell's claim on the one hand and south-west across Boatman's Creek on the other hand, and, gradually dipping westward, should pass below the water-line of the main valley. This lower auriferous band in the "Old-man bottom" will again have to be noticed in dealing with the other, or south-west, division of the block. There are other and higher bands of the "Old-man bottom" that are known to be auriferous, one of which has been tested on the south-west side of the creek. This, from its strike and dip, would correspond in position, on the north side of the creek, with the immediate locality where gold, on the authority of Mr. John Gallagher, is said to occur on the top of the spur between Boatman's and Burke's Creeks.

At Capleston the slate-rock makes its appearance in the bed of the creek, and, underlying the coal-rocks, extends north and south, and forms the range of higher hills to the northward and the western slope of the range between Boatman's Creek and the north branch of the Inangahua. The core of this range to the south-west is formed of Devonian rocks. One mile and a half to two miles above Capleston the slates pass under rocks belonging to the coal-bearing series, and towards the middle part of this belt of slate the chief quartz-mines of the Boatman's district are situated. The Just-in-Time, the Fiery Cross, the Welcome, and many other claims of lesser note are situated in this part of the slate belt. These have all at one time or another, and each in their turn, been famous gold-yielding mines. Nothing more need be said in justification of the area over which they extend being withdrawn from sale and reserved for mining purposes.

Towards the source of Boatman's Creek the conglomerates at the base of the coal-measures are likely to prove auriferous; but, although a good deal of prospecting has been done in this part of the district, the idea of testing the cements at the base of the coal-bearing series is novel to the miners, and hitherto attention has been directed wholly to the recent wash in the creek-beds.

On the south-west portion of the block alluvial diggings alone exist. The slates of the auriferous series do extend from Boatman's Creek to the Waitahu, or north branch of the Inangahua, opposite the Sir Charles Russell Battery; but up to the present time auriferous quartz reefs have not been found in this area of the slates. Resting on these follow the conglomerates and quartz cements, or coarse or fine sandstones of the coal-bearing series. These are, or should be, gold-bearing, since the same beds are auriferous at no great distance to the south-east. The Pliocene gravels, or

"Old-man bottom," next follow, and are known to be auriferous. There are also, towards the north-west, terraces of early recent, or of Pleistocene date, probably also auriferous.

A tributary of Boatman's Creek drains part of this portion of the block west of the slate range, and its modern gravels have derived gold principally through the cutting-down of the "Old-man bottom," but also in part from the older formations lying farther to the eastward. Frying-pan Creek, more to the south-west, has, however, been the chief seat of alluvial mining in this part of the block, and has undoubtedly derived its gold from all the sources here enumerated, the early recent or Pleistocene terraces excepted.

Along the hillsides bounding the valley of Boatman's Creek the "Old-man bottom" is developed between the disappearance of the coal-bearing series at Capleston and the creek mentioned a mile and a quarter further down the valley. The lower beds of the Pliocene gravels, as on the opposite side of the valley, are on this side auriferous; and along the junction between these and the coal-rocks rich coarse alluvial gold was found. This was worked out in the beds of the small creek without leading to the prospecting of the underlying Older Pliocene gravels, from which the gold in the creek had been immediately derived. Some distance further down the valley a claim has been opened out, and partly worked, on Mr. Boardman's farm. This is so clearly in an auriferous band of the Older Pliocene gravels that it is thus of peculiar interest and importance. The average result as yet obtained is 5 dwt. of gold to the ton of gravel put through the boxes. Mr. Boardman works the ground himself when water is to be had. Work can only be done in wet weather, or when an old prospecting drive has sufficient water in it to supplement that collected on the surface.

(*Extracts from Mr. McKay's "Report on the Geology of the South-west Part of Nelson and the Northern Part of the Westland District," Mines Reports, C.-13, 1895.*)

The auriferous Maitai series of rocks, which are of Carboniferous age, must therefore not only be regarded as supplying gold to the creeks and mountain streams, of which they form the bed and bounding valley slopes, but also they must have largely contributed gold to those alluvial formations that are at some distance from slate areas, and that usually rest on tertiary clays or soft sandstone. Thus the presence of alluvial gold in the gravel deposits of the low grounds may indicate the source of the gold in one case as being in the neighbouring range, and in other cases as being at a considerable distance. For example, at Langdon's, Blackball, and Moonlight, on the north-west side of the Grey Valley, the gold is mostly derived from the slates of the adjoining range, while on the south-east side of the Grey Valley, from the Arnold to the Big Grey, it would be hard to say from what particular area of slate the gold of Nelson Creek, Orwell Creek, or Napoleon Hill has been derived.

* * * *

In the *Moonlight Valley* the auriferous gravels are mainly derived from the destruction of the surrounding Maitai slates and sandstones. To a small extent gold may have been derived from a development of breccia-conglomerate at the base of the coal-bearing series that, from the north-east, reaches into the bed of the creek opposite the township. The valley of this stream, including also the valleys of some lesser creeks, has been famous for the coarse and nuggety character of the gold found in the alluvial deposits. But in the mode of its occurrence the gold is very patchy, and for long periods the miners work without any return or sufficient reward for their labour. On the whole, however, they are well satisfied with the results, and most of the miners have worked in the near vicinity of where they now are since the first of the rush, or since their arrival at Moonlight.

* * * *

North Branch of the Inangahua to Boatman's Creek.—There are two or three creeks that, taking their rise on the front range between the Waitahu or north branch of the Inangahua and Boatman's Creek, below Capleston, have along their courses alluvial deposits that have been worked for gold. The high terraces, downs, and hill-slopes drained by these lesser creeks, of which Frying-pan Creek is perhaps the most important, are formed of old high-level deposits, "Old-man bottom," quartz drifts, and conglomerates under the coal formation or auriferous Maitai slates, and each and all of these different gold-bearing formations probably have yielded auriferous material to the modern gravels along the different creek-beds of this part.

In *Boatman's Creek*, where the area of recent alluvial deposit is even more considerable, all the sources immediately above mentioned have contributed to the auriferous character of the gravels in the creek-bed below Capleston. Unfortunately, below the point where the valley widens the low grounds along the banks of the creek are likely to prove wet, and the sinking to bottom on the "Old-man" gravels on which the recent deposits rest will be, as a consequence, difficult. In the upper part of Boatman's the gold is derived from Cretaceo-tertiary conglomerates and gneissic rocks.

In *Little Boatman's Creek* the gold is derived from Maitai slates in Specimen Hill, from conglomerates at the base of the coal-bearing series, and from gravels of the "Old-man bottom," all these sources contributing material towards the formation of the recent gravels in the bed of the creek.

THE CYANIDE PROCESS REGULATIONS.

THE following regulations under "The Cyanide Process Gold-extraction Act, 1897," have been gazetted:—

1. Every application for a license under the said Act shall be made, in the form numbered 1 in the Schedule hereto, or to that effect, to the Warden of the district wherein or nearest whereto is situate the mine wherein the licensee proposes to use or employ the patent rights referred to in the said Act.

2. Such application shall be lodged in the Warden's office either personally, or by a barrister or solicitor of the Supreme Court, or a registered mining agent.

3. As soon as practicable after receipt of such application the Warden shall issue to the applicant a

license in the form numbered 2 in the Schedule hereto, or to that effect, and shall also forward a duplicate original of such license to the nearest Inspector of Mines, who shall retain and file the same.

4. Before the license is issued it shall be recorded in the Warden's Court by the Mining Registrar, in a book to be kept for the purpose, and the Mining Registrar shall certify on the face of the license that such record has been made.

5. Every license shall be deemed to be issued, and shall be held, subject to the terms and conditions following, that is to say :—

(1.) That the licensee duly and punctually pays the royalty hereinafter prescribed, and faithfully observes and complies with the provisions of the said Act, and the regulations from time to time in force thereunder.

(2.) That on breach of any of the terms and conditions subject to which the license is held, any Warden may, in his discretion, cancel the license.

6. The royalty shall be payable on the following graduated scale according to the value of all gold and silver produced from each ton of quartz or other ore in the mine wherein the said patent rights are used or employed, that is to say,—

(1.) One and a half per cent. of such value where such value does not exceed £3 per ton ;

(2.) Two per cent. where such value exceeds £3 but does not exceed £4 per ton ; and

(3.) Two and a half per cent. where such value exceeds £4 per ton.

7. The royalty on all gold and silver produced between the 20th day of August, 1897, and the date of the license shall be payable by the licensee when making the first payment, as hereinafter prescribed, in respect of the gold or silver produced subsequent to such date.

8. The royalty on all gold and silver produced subsequent to the date of the license shall be payable by the licensee on or before the seventh day of each calendar month after such date, each such payment being in respect of the gold and silver so produced during the then last-preceding calendar month.

9. For the purpose of enabling the amount of the royalty to be ascertained and computed, each licensee shall, on or before the due date of each periodical payment in respect of royalty, furnish to the Receiver of Gold Revenue for the mining district wherein the license is issued a return in the form numbered 3 in the Schedule hereto, or to that effect, showing for each such period the total number of tons of quartz or other ore treated, the total number of ounces of gold and silver respectively produced, the value thereof, and the amount of royalty payable in respect thereof.

10. Such return shall be verified by the statutory declaration of the licensee, or some responsible person competent to speak to the facts.

11. All royalty shall be payable to the Receiver of Gold Revenue for the mining district wherein the license is issued.

12. If any person commits any breach of any of the foregoing regulations, then, in addition to any other penalty or punishment to which he thereby exposes himself, he, and in the case of a company the manager and every director thereof, are severally liable to a penalty not exceeding £5.

13. The Receiver of Gold Revenue for the district wherein any license is issued shall, not later than the 10th day of January, April, July, and October in each year, transmit to the Minister of Mines at Wellington a statement, in the form numbered 4 in the Schedule hereto, or to that effect, of all royalties, penalties, and other moneys received by him under the said Act during the previous three months.

SCHEDULE.

Form 1.—Application for License.

To the Warden at .

[*Full name and address of applicant*] hereby makes application for a license, under the provisions of "The Cyanide Process Gold-extraction Act, 1897," for the use and employment of the therein-mentioned patent rights in the Mine [*or* Battery], situate at , for the extraction of gold and silver from quartz or other ores.

[*Signature of Applicant.*]

Dated at , this day of , 189 .

Form 2.—License.

Pursuant to the provisions of "The Cyanide Process Gold-extraction Act, 1897," and the regulations thereunder, and to the application in this behalf dated the day of , 18 , [*Full name and address of licensee*] is hereby licensed to use and employ in the applicant's mine situate in [*Mining district, if any, and locality*], and known as [*Name of mine*], the patent rights referred to in the said Act; subject nevertheless to the payment of the royalty and the observance of the terms and conditions prescribed by the said Act and the regulations from time to time in force thereunder.

As witness my hand, this day of , 18 .

, Warden, Mining District.

I certify that this license is recorded in the Warden's Court at .

, Mining Registrar.

Form 3.—Return to be furnished to Receiver of Gold Revenue by Licensees.

I, A.B., [*Full name, occupation, and address of declarant*] do solemnly and sincerely declare as follows:—

1. That I am the holder of a license under "The Cyanide Process Gold-extraction Act, 1897," in respect of [*Name and locality of mine to which the license relates*] [*or* the mine-manager (*or as the case may be*) of (*Name and locality of mine*) in respect whereof (*Full name and address of employer*) is the holder of a license under "The Cyanide Process Gold-extraction Act, 1897"].

2. That the following statement contains a full, true, and accurate return of all quartz or other ores treated in the said mine during the period [*or* respective periods] therein mentioned whilst using or employing the patent rights referred to in the said Act, the number of ounces of gold and silver respectively produced thereby, the values thereof, and the amount of royalty payable in respect thereof, as prescribed by the regulations under the said Act:—

Return.

Period.	Tons of Quartz or other Ores.	Gold.		Silver.		Total Value.	Value per Ton.	Royalty.	
		Oz.	Value.	Oz.	Value.			Rate.	Amount.
			£ s. d.		£ s. d.	£ s. d.	£ s. d.		£ s. d.
(1) 20th August, 1897, to [*Date of license*]									
(2) [*Date of license*] to [*End of the same calendar month*]									
Totals									

And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the provisions of "The Justices of the Peace Act, 1882."

A.B.
[*Signature of declarant.*]

Declared at , by the said A.B., [*Full name of declarant*] this day of , 18 , before me—
C.D.,
J.P. [*or* Solicitor, *or* Authorised Postmaster.]

Form 4.—Quarterly Statement to be furnished to the Minister of Mines by Receivers of Gold Revenue.

Office of Receiver of Gold Revenue, , 189 .

STATEMENT of Royalties, Fees, Penalties, and any other Amounts received in Pursuance of the Provisions of "The Cyanide Process Gold-extraction Act, 1897."

—	Quarter ending 31st March, 189 .	Quarter ending 30th June, 189 .	Quarter ending 30th Sept., 189 .	Quarter ending 31st Dec., 189 .	Total Amount received.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Royalties ..					
Fees					
Penalties ..					
Other receipts ..					

, Receiver of Gold Revenue.

THE Marlborough Mining District, as constituted by Proclamation published in the *Gazette* of the 22nd November, 1888, has been abolished, and a new district constituted on the 10th February, 1898, with the following boundaries: All that area in the Provincial District of Marlborough bounded towards the north and west generally by the Provincial District of Nelson, from Tophouse to the Pelorus River, and by the left bank of that river to the waters of Pelorus Sound; thence by the waters of Pelorus Sound to the south-western boundary of Section No. 2, Ohingaroa Bay, Linkwater Survey District; thence by a right line to the south-western boundary-line of Section No. 152 of the said survey district, and by that boundary produced to Okiwa Bay; thence by the waters of Queen Charlotte Sound to Reserve D, Town of Picton, and by that reserve to Wellington Street; thence by Wellington Street and London Quay to the Picton and Blenheim Railway-line; thence by that line to the Wairau River; and thence by that river to the commencing-point: excepting from the above area Section No. 1, Block XIV., Linkwater Survey District, and Sections Nos. 1 to 33 inclusive, Block X., Wakamarina Survey District, within the aforesaid boundaries. Also all that area in the Provincial District of Marlborough bounded towards the north and north-west by Port Gore, from the north-eastern corner of Section No. 3, Block XII., Gore Survey District, to Cape Jackson; thence towards the south-east generally by Queen Charlotte Sound to Section No. 111, Linkwater Survey District, in Torea Moua Bay; thence again towards the north-west by the said Section No. 111; again towards the north and towards the west by Section No. 93, Linkwater Survey District, to the summit of the watershed between Kenepuru Sound and Queen Charlotte Sound; thence again towards the north-west by the summit of the said watershed and the summit of the watershed between Pelorus Sound and Queen Charlotte Sound, over Mount Stokes, to a line joining the north-eastern corner of the said Section No. 3 and the north-eastern corner of Section No. 50, Block VIII., Gore Survey District; and thence again towards the north by that line to Port Gore, the place of commencement.

THE quantity of coal shipped from Westport during the year ended the 31st December, 1897, was 295,643 tons, of which the Westport Coal Company sent away 244,559 tons, and the Cardiff Coal Company 51,084 tons. The number of sleepers shipped during the year was 32,266.

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THE
New Zealand Mines Record.

FEBRUARY 16, 1898.

[Issued by the Mining Bureau of the Mines Department, New Zealand, under the authority of the Hon. A. J. CADMAN, Minister of Mines.]

NOTES AND COMMENTS.

THE export of gold and silver for the first month of the year shows a small increase compared with the corresponding period in 1897. The following are the returns telegraphed to the Customs Department from the principal ports at which bullion is exported:—

JANUARY, 1898.			JANUARY, 1897.		
Port.	Quantity.	Value.	Port.	Quantity.	Value.
GOLD.	Oz.	£	GOLD.	Oz.	£
Auckland ..	7,541	29,064	Auckland ..	3,956	13,688
Westport ..	1,866	7,466	Westport ..	691	2,763
Greymouth ..	3,758	15,034	Greymouth ..	7,012	28,047
Hokitika ..	3,648	14,594	Hokitika ..	3,228	12,912
Dunedin ..	8,073	33,100	Dunedin ..	9,020	36,950
Invercargill ..	877	3,508	Invercargill ..	1,058	4,232
Totals ..	25,763	102,766	Totals ..	24,965	98,592
Increase ..	798	4,174	..	..	..
SILVER. Auckland ..	12,331	1,420	..	8,047	908
Increase ..	4,284	512	..	..	..

The bullion returns from the Hauraki Mining District for the month of January, though showing an increase over those for the same period of last year, are not so large as they were for the month of December, but this is attributable to the holidays, no work of any importance having been done at the batteries during the early portion of the month, and in consequence the Waihi and other mines do not figure in the list of companies which sent in battery returns; but, now that the reduction-works at the principal mines are again fully employed, steady returns may be looked for. The Consolidated Goldfields of New Zealand and the Progress Mines of New Zealand Companies, which have carried out important development works on their various properties in the Reefton district, on the West Coast, will soon be in a position to keep their 40-head mill constantly employed. The large reduction-works of the Moanataiari Company, at the Thames, including a 60-head mill, have been finished, and batteries for a number of other companies are in course of erection. A considerable addition will be made to the gold-dredging fleet in Otago in the winter, while there is a good deal of activity on the various southern goldfields. There is therefore every reasonable probability of the gold yield for 1898 being on a par with that of 1895, which was the highest for a period of eighteen years.

IN the Otago Mining District permits have been granted by the Acting Inspector of Mines, under "The Sunday Labour in Mines Prevention Act, 1897," for twenty-two men to work on Sundays—thirteen in four coal-mines, eight in two quartz-mines, and one in sluicing claim. In the Hauraki Mining District permits have been granted by the Inspector in connection with fourteen quartz-mines and cyanide-works for 135 men.

THE lands held under lease by the Kauri Timber Company, declared to be surrendered to the Crown and available for mining purposes, are specifically set forth in the Government *Gazette* of the 10th instant. They include 11,429 acres, part of the Tairua Block; 990 acres, part of Puketui Block; 497 acres, part of Te Karo No. 1 Block; 5,068 acres, Ounuora No. 2 Block; and 468 acres, northern portion of Kapowai Block. These lands will be available under the provisions of the Mining Acts on and after the 14th March, subject to all mining rights and privileges heretofore granted by the Warden.

ABOUT 6,250 acres at Deep Creek are to be reserved for mining purposes, in accordance with the recommendation of the Goldfields and Mines Committee on the petition of Charles Curtis and others, but no rights whatever are to be granted thereupon. The following are the boundaries: On the northward by the Mawheranui Survey District; on the eastward by Block III., Brunner Survey District; on the southward by Block IV., Brunner Survey District; and on the south-westward (generally) partly by the Midland Railway Reserve and partly by the River Arnold: excepting from the above-described area the freehold sections Nos. 1 and 2, Block II., Brunner Survey District (J. Molloy's).

Licenses for prospecting outside mining districts have been issued in favour of Arthur Barry, of Titipua, Mataura, on Section 55, Block V., Lindhurst Hundred, containing 173 acres. A. J. Symons, of Wakarara, on Sections 3, 2, and 1, Block V., Ruataniwha Survey District; Section 1, Block I.; Sections 1 and 6, Block II.; Sections 1 and 3, Block III.; and Lots 1 and 2, Block IV., Makaretu Survey District—the area embracing about 31,500 acres, bounded towards the north by the Waipawa River, on the east by the Ruahine Special Settlement, on the south by the Makaretu River, and on the west by the top of the Ruahine Ranges. David Stuart, of Timaru, in the Acland and Mount Peel Survey Districts, Canterbury.

A resolution forwarded by the Maniototo Farmers' Club in November last, together with correspondence from Mr. J. McKay, of Wedderburn, respecting the water-race licenses held by Mr. Louis Dyer on land occupied by Mr. McKay under perpetual lease, have been reported on. A communication has been forwarded to the president of the club pointing out that, as no objection was raised by Mr. McKay to the issue of the water-race licenses when they were first applied for, the Government cannot now interfere in respect of the proceedings recently instituted by him before the Warden's Court at Naseby; and, further, that if Mr. McKay felt himself aggrieved at the decision of the Warden in the case referred to, an appeal could have been lodged by him, as provided in the Mining Act.

The Denniston Colliers' Medical Association have asked that, in the event of a member getting disabled for life, an allowance of 7s. 6d. or 10s. per week should be made to keep him, pointing out that under present conditions, when a man receives £50, and that amount is expended, he is dependent upon charity. A reply has been sent to the association, that the amounts payable from the sick and accident fund in terms of the regulations under "The Coal-mines Act, 1891," cannot be increased to coal-miners who may meet with accidents which result in their being permanently disabled; but there is no objection on the part of the Mines Department to the Denniston Colliers' Medical Association, which is registered under "The Friendly Societies Act, 1882," increasing the amounts payable under the rules of the society, so long as such rules are within the scope of the provisions of the Act under which they are registered.

A communication from Mr. E. C. Harden, Westport, secretary to the Heaphy Prospecting Association, has been forwarded to the Mines Department by Mr. R. McKenzie, M.H.R. for Motueka, stating that the association was formed for the purpose of prospecting the country north of the Karamea and up the Heaphy. Two of the party set out, and have now established their camps. "They met with great difficulties, inasmuch as it rained almost at all times whilst they were out. On this account they were not able to accomplish very much; but now, with the knowledge of the road, their camps, and with better weather, they can reach in six days their furthest camp, whereas to go to the spot where it is established—viz., up the Heaphy River—took them two months or more. The prospectors have returned to town, and, at a meeting of the members of the syndicate held the other day, it was decided to pay up accounts, and endeavour, with your help, to obtain Government assistance to carry on the work. Those who know the country state that they have little, if any, doubt that there is good gold in the Heaphy and Upper Karamea districts, and I have no doubt you are yourself well acquainted with the nature of the country thereabouts. I send you with this letter two specimens obtained by our prospectors, and will be much obliged if you will bring this matter under the notice of the Minister of Mines, with a view to obtaining the usual Government subsidy in aid of prospecting. So far our expenditure amounts to £120, £48 of which went in wages, and the balance in food, tents, boats, tools, &c. We have three tents on the river-bank, two boats, and all tools required for prospecting." A reply has been sent intimating that, on the regulations under which subsidies are granted to prospecting associations being adopted by the association, payments will be made at the rates prescribed under Class I. or Class II., according to the nature of the prospecting operations undertaken. The name of the bank at which the association's account is kept, and the names of the officers who are to operate on the bank account, should be furnished, as payments can only be made through the bank. If, however, the Buller County Council will recommend the application of the association, payments can be made through the County Fund.

During the month of January there was shipped at the Port of Westport 21,236 tons of coal—17,891 tons 18 cwt. by the Westport Coal Company, and 3,344 tons 2 cwt. by the Cardiff Coal Company; and 4,450 sleepers.

COMPLAINTS having been received from the Miners' Union as to defective ventilation at the Inangahua low-level tunnel, the matter has been reported on. Since last August eight different visits of inspection were made, five by the Assistant-Inspector, and three by the Inspector of Mines. No complaints were received from the miners working in the face, the men stating that if they opened the valves to the full it would be too cold. Two jets of compressed air kept the face perfectly clear of all smoke. The Inspector states that on three different occasions when he visited the tunnel (28/10/97, 25/11/97, and 22/12/97) no gases of an offensive nature existed, either from the fumes of dynamite or from any other cause. When visiting the tunnel he made it a point of duty to ask the miners at the working face if they had any complaints to make with reference to bad air, and on all occasions the same answer, "No," was given. Mr. Pearce, the superintendent of the mine, promised to extend the air-boxes 1,000 ft.

A VOUCHER for £25 has been passed for payment by the Public Trustee out of the Coal-miners' Relief Fund in favour of Mr. Thomas Wilson, sen., on account of the death of his son at Bannockburn, Otago, on the 15th January. The Acting Inspector of Mines, who was at Bannockburn a day or two after the accident happened, stated that young Wilson was the principal support of his parents, and the case was therefore submitted for favourable consideration. Reporting on the accident, the Inspector stated: "The pit mouth is on the Bannockburn side of the Kawarau River. The coal is all sent across the river in bags by a wire tramway. So far as can be learned, young Wilson (who was twenty-nine years of age) was about to cross the wire in the cage used for conveying the coal across. He had a trick of giving the cage a push and jumping on when in motion, to obviate pulling himself across all the way by the haulage rope. It is thought he had been too late in his jump and so fallen into the river, either directly or by not being able to work himself on to the cage when in motion. No one actually saw the accident, but his coat, &c., were found on the cage."

INQUIRIES are sometimes received as to whether protection can be granted for mineral discoveries in areas situated outside of mining districts. It is, therefore, as well that it should be generally made known that no protection can be granted in connection with any discovery of a prospector until the locality has been included in a mining district.

THE specifications for shelter-shed and snow-poles on the Old-man Range, Otago, submitted by the Tuapeka County Council, have been approved by the Mines Department, which has granted a subsidy of £50 towards the cost of erecting these conveniences for travellers on the range. In the Council's application for a subsidy it is stated that "before the Provincial Government of Otago erected sheds and poles a large number of lives were lost on this range, and the graves of fourteen men who perished there can still be seen on a spur near Gorge Creek, but very few lives were lost after the erection of poles and sheds." The shed is to be built of the best stone procurable in the district, pointed with lime-mortar inside, and cement-mortar outside, with iron roof, a fireplace, and two bunks. The poles, which are to be erected 4 chains apart, extending from the shelter-shed to Donoghue's Rock, a distance of about a mile and a quarter, are to be of 2 in. galvanised-iron pipes. Ten of the poles are to be 9 ft., and fifteen 7 ft., above the ground.

MRS. FLORA COUTTS, of Dunback, Otago, has sent a complaint to the Hon. the Minister of Mines to the effect that her land has been rendered almost worthless through the erection of a battery and the making of a dam on the northern side of the section held by her. The matter was referred to the Crown Lands Department, which sent the following memorandum: "Mrs. Coutts was granted a deferred-payment license in December, 1889, over the section in question. She subsequently, in June, 1894, exchanged the license for a lease in perpetuity under section 150 of 'The Land Act, 1892.' The present lease has a provision inserted declaring that the land is held subject to the provisions of section 7 of 'The Mining Act Amendment Act, 1893 (No. 2).'" Mrs. Coutts has been informed that, as her lease is subject to the provisions of the Mining Acts, the Government cannot interfere in the matter.

As illustrating the widespread interest which is being aroused in dredging as a method of gold-saving (writes a Central Otago correspondent of the *Southern Cross*, Invercargill), we had a visit last week from two Russian gentlemen, all the way from Siberia, to ascertain something of our methods and machinery, and they express themselves as greatly pleased with what they have seen, and purpose introducing this system upon returning home, where at present they employ a method similar to what was in use here twenty years ago.

The application of Mr. Daniel Ferguson for the resumption of Block IV., Waikaia, for mining purposes, having been reported upon, the Hon. the Minister of Mines, in accordance with the provisions of section 17 of "The Mining Act Amendment Act, 1896," has determined that the land in question be not resumed. In the report it is said that every old digger in the place stated that there is no gold in that portion of the river or district. The men employed in prospecting by Mr. Ferguson, who were supposed to be at work for six weeks, had not done two days' work during the time they were on the ground. Mr. Morrah, the owner of the property, in a memorandum, stated that he was unaware of the existence of gold in payable quantities on the land. He had no wish to put any unreasonable obstacles in Mr. Ferguson's way, and he could obtain consent to work on the land without raising any question of resumption and the attendant litigation that must necessarily ensue. Mr. Morrah adds that "the question of riparian rights would be a very large one if any such application were granted."

A communication has been received from Mr. Hugh Rees, Armchair Creek, Wairau Valley, Marlborough, who is the holder of a miner's right, inquiring if he can legally hold two men's ground which he has pegged off on freehold property belonging to Messrs. Bell Brothers, of North Bank Run. Mr. Rees has been informed that he cannot mine on private land without the consent of the owners, but auriferous land within a mining district can be resumed for mining purposes by making application to the Hon. the Minister of Mines, accompanied by a deposit of £25, provided that after inquiry it is determined to resume the land applied for.

During the month of January sixty-eight steamers and one sailer, representing 22,625 tons register, entered the Port of Westport, and sixty-six steamers and one sailer left the port, representing 22,237 tons register: total tonnage, 44,862. The schooner "Wm. Bowden" shipped 1,258 tons of coal for Honolulu. The mean depth for the month on the bar was 22 ft. 10 in., and in river 18 ft. 10 in. The rainfall for the month was 6·79 in.

The alterations to the battery at the Thames School of Mines are nearly finished, the new assay-room is approaching completion, and in a few weeks everything will be in working order. There are 6 tons of ore ready for treatment as soon as the battery is properly equipped.

During the recent visit of the Right Hon. the Premier to the West Coast a deputation from Charleston asked for a grant of £300 for 600 ft. of new pipes for the Ballarat Siphon, Argyle Race, and other repairs. Messrs. O'Regan, Lander, Colvin (Mayor), Dwyer, R. McKenzie, M.H.R., and others described the injury to the miners caused by the continual breaks in the pipes. The County Council were unable to make repairs, and the miners could not do so. Half the population was injuriously affected by the breaks, and old pioneer miners had their means of living injuriously affected. Twenty-four men were directly thrown out of work by the loss of water. The Premier said the legal position was that the race was vested entirely in the County Council, and he told the men to go to the County Council. It was monstrous if the Council would not step in and, by the expenditure of £18 a year in interest, save the living of twenty men. The Government could not pour in money at every turn. If the county would not find the money it would pay the men to contribute it themselves. Messrs. Lander, McKenzie, Parsons, O'Regan, and others strongly urged the Government to give assistance. Mr. Seddon eventually promised to lay the matter before the Minister of Mines, but he objected to coming to the Government for everything. He would ask the legal authorities if the County Council were not compelled to keep the race in order. The county might get the work done, and perhaps a grant would be got next session of Parliament. Any vote now would be stuck up by the Audit Department.—*Westport Times.*

Mr. Warden McCarthy made some pertinent remarks on the much-vexed question of friendly suits in Wardens' Courts during a recent sitting of the Warden's Court held at Queenstown. He intimated that he had always been of the opinion that these suits were mere empty forms, having no legal efficacy whatever. There was no real plaintiff, no real defendant, and no real issue in litigation between the parties. Throughout each proceeding the plaintiff and defendant were acting in collusion. These suits had largely been availed of to enable persons to hold mining privileges for long periods without using them, and when invoked for such a purpose were clearly, as recently indicated by his Honour Judge Ward, at Greymouth, a fraud on the mining public as well as an evasion of the Mining Acts. He (the Warden) had always set his face against friendly suits being used for such a purpose. However, they were frequently instituted to get rid of the difficulty brought about by the non-payment of the renewal-fee within the statutory period, the mining privilege—the subject of the license—having meanwhile been duly worked. For this purpose, and for this purpose alone, could he in any way countenance the continuance of friendly suits in the Warden's Courts over which he presided; though it would be as well for owners of mining privileges requiring periodical renewal to distinctly understand that he (the Warden) had very grave doubts whether a friendly suit, even when instituted for such an apparently innocent object, carried out the intention of the suitors—namely, the reinstalment of the mining privilege (the subject of the suit) without any loss of priority. It would be well to note, in connection with this latter class of friendly suits, that, except in the case of the earlier Mining Acts of this colony, there is no obligation cast on the licensee to renew, whilst, under at least one Mining Act, it would seem to be tolerably clear that failure to renew within the sixty days provided for in the statute actually deprived the licensee of the right to renew. How, then, under such circumstances (said Mr. McCarthy), can the Warden's Court, apart from all questions as to the collusive nature of the proceedings, have jurisdiction to entertain a complaint alleging an offence not recognised by the law in the one case or inflict a fine and order a renewal in the other? However, as friendly suits dealing with the non-payment of license-fees have been common in the Australasian Colonies from the earliest foundation of the goldfields, he would not interfere with the practice, although he regarded it as a bad precedent as well as a clumsy device, and its legal efficacy as more than doubtful. Friendly suitors must, moreover, bear in mind that mining privileges affected by section 16 of the amending Act of 1895 cannot, after the expiration of the period therein provided for, be renewed by friendly suit, even where the non-payment of the prescribed rent or fee is the only ground for forfeiture.—*Lake Wakatipu Mail.*

An application for a permit to dredge for gold in Mahakipawa Arm, Pelorus Sound, was made to the Marine Department last month by Mr. Henry Whiting, of Havelock, who has been informed that he should apply to the Warden for a dredging claim under section 28 of "The Mining Act, 1895." This will permit of its being properly advertised and due inquiry made before the issue of a license.

A lignite license has been granted to D. Hepburn and A. Arthur, 20 acres, Naseby.

At the last sitting of the Warden's Court at Paeroa the Waihi Gold-mining Company appealed under section 4 of the Act of last session to prevent the "unnecessary employment of manual labour in mines on Sunday." The appellant company desired to employ more men than the number allowed by the Inspector, to enable it to keep the battery at work on Sunday. It was contended that the interpretation of the word "mine" did not include special claim, and that a battery might be erected on a site expressly granted for the purpose, which was held under a separate license from the claim, and might be off it altogether. The Warden held that the battery was included in the interpretation of the word "mine," because it was a "place" wherein operations were carried on for the treatment of the products of the mine, and that the Act did not give the Inspector power to grant permission to work the battery on a Sunday. His authority only extended to cases where he was satisfied that the labour could not be suspended on Sunday without risk of injury to the mine or its operations.

Mr. A. C. Yarborough, who applied for a license to prospect and mine for coal on the north shore of the Hokianga River, within the limits of Blocks X. and XIV., Mangamuka Survey District, has been informed that there is no power to issue licenses to prospect for coal; but a lease can be obtained on compliance with the provisions of section 4 of the Act for mining for coal on Crown lands.

In reference to the protection granted for six months from the 4th October, 1897, to the Golden Run Dredging Company (Limited), Otago, for special claim, a communication has been received from the secretary of the company stating that arrangements are now being made for putting on a larger dredge, with all the latest improvements.

Reports having been received in reference to the Keep-it-Dark Mine, at Reefton, the Inspector was instructed to inform the manager of the mine that if the repairs to the pass between No. 2 level and the adit level were not completed, as promised in a written memorandum dated the 23rd December, proceedings would be instituted for recovery of a penalty for breach of the rules under "The Mining Act, 1891."

The appointment of Mr. E. J. Williams as drawing-instructor at the Thames School of Mines, *vice* Mr. John Parr resigned, has been approved.

Mr. James McLaren, one of the most brilliant students at the Thames School of Mines, of which he had temporary charge about a year ago during the absence of Mr. Allen, has been appointed instructor at the Coromandel School of Mines. Mr. McLaren studied two years at the school of mines in connection with the Otago University, and during the past year he has been attending the Auckland University.

The following paragraph, copied from one of the West Coast papers, found its way into many journals in the colony: "It was rumoured in town yesterday that three Chinamen found a nugget weighing 16 lb. near Reefton. The value would be about £768." An officer of the Mines Department, who was applied to for information, replied, "There is no truth in this report. It was only a joke amongst the Chinese."

The death of Mr. James McGregor at Coromandel, about a fortnight since, was recorded. The *News* states that the deceased, who arrived in the colony thirty-seven years ago, was reputed to be the oldest resident of Coromandel, the holder of the first miner's-right, and the discoverer of the first reef (Scotty's, in the upper township). With the exception of two years which the deceased spent at the Thames, he resided at Coromandel since his first arrival in the colony.

A license for a special claim of 100 acres on the Ninety-mile Beach, Canterbury, which has been included in the Otago Mining District, was forwarded last month to the Warden at Oamaru, in favour of W. H. Zouch and G. W. Sandiland.

A special feature of the Otago Jubilee Industrial Exhibition, to be held this year, will be the mining and metallurgical section. The following committee are to have charge of this section: Dr. Black, M.A., D.Sc.; Dr. Don, M.A., D.Sc.; Professor Ulrich, F.G.S.; Mr. John Gow, late Inspector of Mines; and Mr. J. P. Smith, M.A.I.M.E.

The prospectus of the Pike's Peak Tunnel Company, Colorado, capital £10,000,000, in 500,000 shares of £20 each, has been issued in London. The *Mining Journal* remarks, "This appears, on the face of it, to be a colossal capitalisation, but when one takes into consideration the magnitude of the enterprise and the richness of the goldfields which it will tap it cannot be considered to be more than adequate for the purposes to which it will be devoted. According to our Colorado correspondent, the sources of anticipated revenue will be—(1) Payments by owners of surface mines for drainage facilities afforded by the tunnel, such payments being specified in written agreements obtained before the driving of the tunnel; (2) royalties by owners of surface mines for transportation facilities afforded by the tunnel; (3) from the veins encountered in the tunnel. A matter vital to the working of the great enterprise is the cost of driving the tunnel, and this it is satisfactory to learn will be carried out economically, and, so far as can now be seen, with fair rapidity. The improvement effected during recent years in drills and other appliances have much simplified the method and decreased the expense of tunnel-driving. The drills will probably be driven by electric power, and it is anticipated that before the tunnel has penetrated very far a sufficiency of water will be tapped to generate all the necessary electrical power."

THE GOLD-MINING INDUSTRY IN NEW ZEALAND.

THE following is an approximate return of the areas held under the Mining Act, annual rental, number of men employed and average earnings, number of registered companies, value of gold produced since registration, amount of capital actually paid up, and quantity and value of gold exported from 1857 to 31st December, 1897:—

Area of Special Claims, Licensed Holdings, &c., 31st March, 1897.	Annual Rental.	Number of Men Employed.	Average Earnings of Men Employed	Number of Registered Mining Companies 31st December, 1896.	Value of Gold produced since Registration to 31st December, 1896.	Total Amount of Capital actually paid up to 31st December, 1896.	Quantity and Value of Gold Exported from 1857 to 31st December, 1897.	
							Quantity.	Value.
Acres. 133,282	£ 53,650	14,889*	£ 68	461	£ 2,334,617	£ 1,559,226	Oz. 13,565,552	£ 53,372,634

* Made up of 12,900 Europeans and 1,989 Chinese.

BATTERY AND GOLD RETURNS.

HAURAKI GOLDFIELDS.

Battery Returns for January, 1898.

Name of Company, Mine, or Battery.	Locality of Mine.	Number of Tons of Ore crushed.	Number of Pounds of Specimens crushed.	Number of Tons of Tailings treated.	Yield of Bullion.	Yield of Gold.	Value.
					Oz. dwt. gr.	Oz. dwt. gr.	£ s. d.
Hauraki	Coromandel	130	194	..	..	448 0 0	..
Royal Oak of Hauraki	"	10	440	..	..	566 4 0	1,413 2 10
Kapanga	"	8	55	..	..	77 2 0	..
Hauraki N.Z. Associated Gold Reefs	Kennedy Bay	9	841	9	..	286 0 0	..
Great Mercury	Kuaotunu	202	..	..	..	43 7 0	..
Waiotahi	Thames	85	..	..	..	111 0 0	297 5 5
May Queen (Hauraki)	"	60	..	..	..	73 11 0	..
May Queen Extended	"	63¼	154	..	..	183 3 0	..
New Alburnia	"	180	..	..	..	45 8 0	..
Mahara-Royal	Tapu	320	..	..	..	168 0 0	..
N.Z. Crown Mines	Karangahake	1,490	..	..	1,153 0 0	..	3,220 3 8
Woodstock	"	651	..	..	3,211 0 0	..	2,006 8 8
New Zealand Talisman	"	232	..	..	818 12 0	..	764 9 6
Waihi-Silverton Extended	"	625	..	..	441 0 0	..	852 0 0
Komata Reefs	Komata	360	..	..	2,174 0 0	..	1,451 16 9
Sundries	..	..	407½	400	..	100 0 0	..

WEST COAST AND OTAGO GOLDFIELDS.

Battery Returns for January, 1898.

Name of Company, Mine, or Battery.	Locality of Mine.	Quartz or Alluvial.	Number of Tons crushed or treated.	Yield of Amalgam.	Yield of Retorted Gold.	Yield of Melted Gold.	Value.
NELSON AND WESTLAND.				Oz. dwt. gr.	Oz. dwt. gr.	Oz. dwt. gr.	£ s. d.
Alpine Extended *	Lyell	Quartz	330	739 10 0	343 4 0	..	..
" " †	"	"	360	332 0 0	123 2 0	..	..
Keep-it-Dark	Reefton	"	302	304 0 0	102 10 0	..	..
Consolidated Goldfields of N.Z. (Wealth of Nations Mine)	"	"	502	..	96 10 0	..	..
Progress Mines of New Zealand (Globe Mine) ‡	"	"	1,600	..	627 13 0	..	..
Ditto	"	"	760	..	336 5 0	..	..
Sir Francis Drake	Merrijigs	"	240	222 0 0	70 3 0	69 8 15	297 14 11
A1 No. 2 Tributers (Jas. Morris and party)	"	"	10	83 16 0	38 11 0	..	..
Big River	Big River	"	170	..	263 10 0	..	..
Victory ‡	Paparoa Range	"	67	..	79 4 0	..	..
Buller Dredge	Fern Flat	Alluvial	(for 3 weeks' work)	..	63 0 0	..	..
Sundries	..	Cement	200	..	..	14 0 0	..
OTAGO.							
Achilles Goldfields	Bullendale	Quartz	704	804 0 0	408 0 0	393 0 0	1,073 0 0
Glenrock Consolidated	Macetown	"	410	1,062 0 0	..	371 5 0	..
Westralia and N.Z. Gold Explorers	"	"	80	60 17 0	..	19 5 12	..
Sundries	..	"	552	..	..	96 1 0	..

* Up to 7th January. † Up to 29th January. ‡ December returns.

Return of the Quantity and Value of Gold entered for Duty* for Exportation from New Zealand from 1st April, 1857, to 31st December, 1897.

Produce of the Goldfields in		During the Quarter ended 31st Dec., 1897.		Entered for Exportation to the 30th Sept., 1897.		Total entered for Exportation from New Zealand to the 31st Dec., 1897.	
County or Borough.	District.	Qu'ntity	Value.	Quantity.	Value.	Quantity.	Value.
		Oz.	£	Oz.	£	Oz.	£
County of Coromandel ..	Auckland	4,986	21,065				
" Thames ..		505	2,131				
" Ohinemuri ..		24,049	85,140				
" Piako ..		..	..				
Borough of Thames ..		572	2,415				
		30,112	110,751	2,107,858	7,948,643	2,137,970	8,059,394
	Wellington ..	..	..	188	706	188	706
	Marlborough ..	..	..	85,604	333,412	85,604	333,412
County of Collingwood ..	Nelson ..	130	520	1,673,009	6,632,643	1,673,139	6,633,163
County of Buller ..	West Coast	2,412	9,649				
" Inangahua ..		1,449	5,797				
" Grey ..		3,693	14,772				
" Westland ..		3,227	12,909				
Borough of Kumara ..		34	135				
" Hokitika ..		97	388				
		10,912	43,650	4,288,778	17,054,955	4,299,690	17,098,605
	Canterbury ..	..	..	24	96	24	96
County of Taieri ..	Otago	640	2,461				
" Tuapeka ..		5,757	23,191				
" Vincent ..		6,746	27,033				
" Maniototo ..		1,179	4,691				
" Waihemo ..		111	453				
" Waitaki ..		366	1,457				
" Lake ..		1,224	5,016				
" Wallace ..		1,680	6,751				
" Waikouaiti ..		94	385				
" Bruce ..		271	1,091				
" Fiord ..		1,642	6,576				
" Southland ..		892	3,590				
		20,602	82,695	5,348,213	21,164,079	5,368,815	21,246,774
	Unknown ..	..	..	122	484	122	484
Totals	..	61,756	237,616	13,503,796	53,135,018	13,565,552	53,372,634

COMPARATIVE RETURN of the QUANTITY and VALUE of GOLD ENTERED for DUTY* for EXPORTATION from NEW ZEALAND for the YEARS ended 31st DECEMBER, 1897 and 1896.

Produce of the Goldfields in the District of	During the Quarter ended—				Totals for Year 1897.		Totals for Year 1896.	
	31st March, 1897.	30th June, 1897.	30th September, 1897.	31st December, 1897.	Quantity.	Value.	Quantity.	Value.
	Oz.	Oz.	Oz.	Oz.	Oz.	£	Oz.	£
Auckland ..	26,392	23,571	25,402	30,112	105,477	392,337	92,346	350,355
Marlborough ..	351	436	23	..	810	3,195	916	3,588
Nelson ..	1,134	..	626	130	1,892	7,055	2,753	10,333
West Coast ..	17,903	12,746	17,256	10,912	58,817	235,430	79,317	317,161
Otago ..	23,841	23,293	16,913	20,602	84,649	342,187	88,362	359,991
Totals for 1897	69,621	60,046	60,222	61,756	251,645	980,204	..	..
Totals for 1896	76,402	44,208	76,051	67,033	..	..	263,694	1,041,428

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* Gold duty abolished in the South Island on the 31st March, 1891, by "The Gold Duty Abolition Act, 1890."

Department of Trade and Customs,
Wellington, 20th January, 1898.

W. T. GLASGOW,
Secretary and Inspector.

List of Gold-mining Companies Registered in New Zealand during the Year 1897.*

Name of Company.	Place of Operations.	Number of Shares in Company.	Capital Value of each Share.		
			£	s.	d.
Kennedy (No Liability)	Kennedy's Bay	80,000	0	1	6
Hinemoa-Hauraki (No Liability)	Kuaotunu	100,000	0	1	6
Eaglehawk (No Liability)	Tararu	80,000	0	2	0
National (No Liability)	Kuaotunu	60,000	0	1	0
Rachel (No Liability)	Kennedy's Bay	60,000	0	1	0
Mangakino (No Liability)	Te Aroha	80,000	0	1	0
Monte Carlo (No Liability)	Kennedy's Bay	100,000	0	1	0
Silas (No Liability)	Puru	90,000	0	1	0
Wealthy Mint (No Liability)	Kennedy's Bay	90,000	0	1	0
New Year (No Liability)	Tairua	100,000	0	1	0
Grosvenor United (Limited)	Thames	23,750	0	2	6
Lioness (No Liability)	Karangahake	60,000	0	0	4
Great Maratoto (No Liability)	Maratoto	80,000	0	0	6
Komata Crown (No Liability)	Komata	80,000	0	1	0
Sceptre (No Liability)	Wharekiraupunga	100,000	0	1	0
Golden Centre (No Liability)	Puriri	100,000	0	1	0
Mount Taylor (Limited)	Thames	60,000	0	5	0
Capstan (No Liability)	Waitekauri	80,000	0	1	0
King of Omahu (No Liability)	Omahu	80,000	0	1	0
Alpine (No Liability)	Thames	72,000	0	1	0
Trojan (No Liability)	Puru	100,000	0	1	6
Opal (No Liability)	Tairua	70,000	0	1	0
Dover Castle (No Liability)	Puriri	80,000	0	1	0
Mount Lyell (No Liability)	Waihi	57,000	0	2	0
Salisbury (No Liability)	Mata Creek	100,000	0	1	0
Newhaven (No Liability)	Waitekauri	10,000	0	2	0
Golden Site Extended (Limited)	Wilson's River, Preservation Inlet	85,000	1	0	0
Waiau Beach Hydraulic-elevating (No Liability)	Waiau Beach	9,000	0	10	0
Thames (No Liability)	Thames	85,000	0	2	0
Chance (No Liability)	Karaka, Thames	70,000	0	1	0
Magnet (No Liability	Coromandel	60,000	0	1	0
Star of the North (No Liability)	Cabbage Bay, Coromandel	60,000	0	0	6
Scotia (No Liability)	Waitekauri	100,000	0	1	0
Albion (No Liability)	Whangamata	90,000	0	1	0
Doris (No Liability)	Cabbage Bay	80,000	0	1	6
Daphne (No Liability)	Puru	60,000	0	1	0
Princess (No Liability)	Karangahake	50,000	0	1	0
Star of Tairua (No Liability)	Tairua	80,000	0	1	0
New Golden Point (No Liability)	Tapu	100,000	0	2	0
Turakina Gold-dredging (Limited)	Manuherikia	4,000	1	0	0
White Cliffs (No Liability)	Great Barrier	80,000	0	1	0
Nova Scotia (No Liability)	Wharekiraupunga	60,000	0	2	0
Maid of Erin (No Liability)	Waihi	50,000	0	2	0
Golden Falls (No Liability)	Whangamata	80,000	0	1	0
Dee Creek Gold-sluicing (No Liability)	Three-channel Flat, Inangahua	36,000	1	0	0
Golden Sand (No Liability)	Addison's Flat, Westport	100,000	0	2	0
Great Republic (No Liability)	Waimangaroa	50,000	0	4	0
Staffa (No Liability)	Great Barrier Island	100,000	0	1	0
Duke of Kent (No Liability)	Waihi	75,000	0	1	0
Kanui Extended (No Liability)	Paparoa Range, Greymouth	24,000	0	5	0
Inland Reefs (No Liability)	Te Aroha	100,000	0	1	0
Lord Rosebery (No Liability)	Maratoto	100,000	0	1	0
Wires (No Liability)	Whangamata	70,000	0	1	6
Ormond (No Liability)	Karangahake	70,000	0	2	0
Waikoromiko (No Liability)	Waikoromiko	80,000	0	1	0
Victoria Dredging (Limited)	Clyde	2,400	1	0	0
Parnassus (No Liability)	Wharekiraupunga	100,000	0	1	0
Boatman's Exploration (Limited)	Victoria Range, Inangahua	50,000	1	0	0
Port Jackson (No Liability)	Port Jackson, Cabbage Bay	150,000	0	1	0
Diamond (No Liability)	Waitekauri	60,000	0	0	6
Grand Consolidated Gold-mines of Tararu (No Liability)	Thames	60,000	0	1	0
Windsor Castle (No Liability)	〃	110,000	0	1	0
Sunlight (No Liability)	Paparoa Range, Grey County	60,000	0	5	0

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* A list of companies previously in existence will be found in the Annual Report of the Goldfields of New Zealand for 1896-97, by Mr. George Wilson, Inspecting Engineer.

List of Gold-mining Companies Registered in New Zealand during the Year 1897—*continued.*

Name of Company.	Place of Operations.	Number of Shares in Company.	Capital Value of each Share.		
			£	s.	d.
Naseby Dredging and Hydraulic-sluicing (Limited)[1]	Main Gully, Naseby	7,000	1	0	0
Akbar (No Liability)	Waikanae, Coromandel	50,000	0	1	0
Edgerton (No Liability)	Great Barrier Island	75,000	0	1	0
Golden Valley (Limited)	Coromandel	150,000	1	0	0
Victoria (Limited)	Upper Blackball, Grey District	24,000	0	7	6
Alpine Extended (Limited)[2]	Lyell	50,000	0	10	0
Alpha (No Liability)	Preservation Inlet District	24,000	1	0	0
Golden Shore (No Liability)	Coromandel	100,000	0	2	0
Ruapaka Alluvial (Limited)[3]	Canvastown	10,000	0	3	0
Buller Dredges (Limited)[4]	Buller River, at Fern Flat	12,000	0	15	0
Garden Gully (No Liability)	Blackball and Moonlight	60,000	0	10	0
Dons (No Liability)	Tararu	100,000	0	0	6
Waiwhero Sluicing (No Liability)	Barrytown	31,000	1	0	0
Caledonian[5]	Barewood	40,000	1	0	0
Roaring Meg Sluicing (Limited)[6]	Blackball, Grey Valley	100,000	0	2	0
Imperial (Limited)[7]	Upper Blackball	28,000	1	0	0
Flossie (No Liability)	Kennedy's Bay	60,000	0	0	8
Te Puke (No Liability)	Te Puke	100,000	0	0	6
Sunrise[8]	Preservation Inlet	30,000	0	10	0
Poneke (No Liability)	Paparoa, West Coast	24,000	0	10	0
Golden Lead (Limited)	"	24,000	0	5	0
Queen of the North (No Liability)	Coromandel	60,000	0	0	8
Lion (Limited)[9]	Nokomai, Otago	12,000	1	0	0
Cumberland Extended (Limited)	Merrijigs, Inangahua	48,000	1	0	0
Waihi Beach (No Liability)	Waihi North	150,000	0	1	0

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[1] 2,000 shares paid up.
[2] 28,125 shares held in trust for the shareholders of the United Alpine Quartz-mining Company, and 15,459 for the shareholders of the Lyell Creek Extended Quartz-mining Company.
[3] 200 shares paid up.
[4] 5s. per share paid up.
[5] Shares to be deemed paid up to 10s.
[6] 50,000 paid-up shares issued in part payment of property sold to company.
[7] 4,000 shares held in reserve.
[8] 10,000 shares fully paid up.
[9] 3,500 shares paid up.

List of Companies which have Increased their Capital during the Year 1897.

Name of Company.	Number of New Shares.	Value of each Share.		Paid up to	Number of Shares already existing.	Date of *Gazette* in which Notice appeared.	
		s.	d.			1897.	
La Mascotte	65,000	2	0	45,000—6d.	75,000	Feb.	4
Invicta	40,000	2	0	..	75,000	"	25
St. Patrick	20,000	0	7	..	100,000	March	18
The Gem of the Tiki	60,000	1	0	..	60,000	April	15
A1	45,000	3	0	..	75,000	"	29
Mata Reefs	75,000	1	0	¾d.	125,000	June	3
Harbour View	80,000	2	0	..	80,000	July	8
Bay View	20,000	1	0	..	60,000	"	29
Fiery Cross	80,000	1	0	..	70,000	Aug.	5
New Golconda	75,000	2	0	9¼d.	75,000	"	12
Alpha	70,000	3	0	..	50,000	"	19
New Whau	25,000	3	0	..	100,000	Sept.	23
Prince of Wales	70,000	1	0	..	80,000	"	23
Mount Waihi	60,000	4	0	..	60,000	"	30
Waitekauri South	80,000	4	0	..	70,000	Oct.	7

NOTE.—All the above are no-liability companies.

SPECIAL CLAIMS AND LICENSED HOLDINGS.

LIST of special claims and licensed holdings issued during December, 1897; also number of forfeitures, surrenders, and transfers during same month:—

District.	Number of Special Claims and Licensed Holdings granted.	Area.	Annual Rent.		Number of Forfeitures or Surrenders.	Number of Transfers.
			First Year.	Second Year.		
		A. R. P.	£ s d.	£ s. d.		
Whangarei	..	..	..	..	1	..
Coromandel	3	179 1 16	39 10 0	79 0 0	19	1
Thames	*20	†961 0 14	183 4 0	351 14 0	42	3
Te Aroha	8	‡740 2 6	132 0 0	250 10 0	4	5
Tauranga	..	..	..	..	1	..
Collingwood	..	..	..	..	1	..
Westport	..	..	..	..	2	1
Lyell	..	..	..	..	1	3
Reefton	2	129 3 20	32 10 0	65 0 0	3	..
Ahaura	..	..	..	..	..	1
Stafford and Goldsborough	..	..	..	..	..	1
Ross	..	..	..	..	5	..
Okarito	..	..	..	..	..	1
Arrowtown	§2	136 0 0	34 0 0	68 0 0	..	2
Queenstown	§1	23 1 30	6 0 0	12 0 0	..	3
Cromwell	4	153 2 10	38 15 0	77 10 0	2	..
Naseby	5	178 2 31	60 0 0	90 0 0	..	..
Waikaia	..	..	..	..	2	..

* Including November. † Including 292 acres and 20 perches Native land. ‡ Including 268 acres Native land. § From August to December inclusive.

List of Companies Wound Up voluntarily during the Year 1897.

Name of Company.	Date of *Gazette* in which Notice appeared.
	1897.
Acropolis Gold-mining Company	Jan. 14
Roseberry Coal Company	" 28
Walton Park Coal and Pottery Company	Feb. 25
Red Mercury Gold-mining Company	" 25
Mokihinui Knights of Labour Coal-producers Company	April 1
Edina Gold-dredging Company	May 13
Island Block Extended Gold Company	" 20
Mount Catherine Gold-mining Company	July 22
Ophir and Ind Gold-dredging Company	" 29
Gallant Tipperary Quartz-mining Company	Aug. 5
Nelson Creek Gold-mining Company	" 5
Rock-and-Pillar Gold-dredging Company	Oct. 14
United Hercules Hydraulic-sluicing Company	Nov. 4
Sew Hoy Big Beach Gold-mining Company	Dec. 2
Roxburgh Gold Steam-dredging Company	" 23
Waikanae Gold-mining Company	" 23

NOTE.—All the above were limited-liability companies.

List of Companies which have Ceased to carry on Business in the Colony during the Year 1897.

Name of Company.	Date of *Gazette* in which Notice appeared.
	1897.
International Syndicate	July 1
Great Mercury Gold-mining Company	Aug. 26
Tokatea of Hauraki	Sept. 23
Komata Queen	Dec. 9
Mines Corporation of New Zealand	" 23
Scotty's Hauraki Gold-mining Company	" 23
The Mahakirau Syndicate	" 23

NOTE.—All the above were limited-liability syndicates or companies.

OTAGO DREDGING RETURNS.

THE following returns for the four weeks ending the 29th January, 1898, have been furnished by Mr. John Gage, secretary of the Dunedin Stockbrokers' Association:—

Name of Company or Dredge.	Locality of Operations.	Yield of Gold.
		Oz. dwt. gr.
Golden Terrace	Shotover	109 7 0*
Otago	Miller's Flat	140 14 0
Golden Run	Miller's Flat	21 0 0
Golden Gate	Island Block	28 19 0
Golden Treasure	Miller's Flat	35 10 0
Enterprise	Alexandra	71 6 3
Ettrick	Ettrick	39 18 0
Upper Waipori	Waipori	64 2 0
Jutland Flat	Waipori	43 8 0
Success	..	14 12 0
Roxburgh Amalgamated†	Roxburgh	137 3 5†

* Amalgam. † Sluicing—Return for December.

THE *Mining and Electrical Review* (San Francisco) announces, under the heading "Other Nets for the Innocents," that "a company has been organized to abstract gold from sea-water—another for manufacturing gold out of antimony." The *Review* pithily concludes, "In California gold is taken out of the mines 'by good hard knocks,' and we have yet to learn that there is any royal road to that end."

CONTRIBUTIONS TO THE CHEMISTRY OF THE CYANIDE PROCESS.

—o—

[By Mr. William Skey, Analyst to the New Zealand Mines Department and Government Analyst.]

II.

The Relative Speed at which the Cyanide dissolves Finely-divided Gold and Gold in the Massive Form.

It will be taken as granted that the finer the state of division in which gold is presented to the cyanide solution the more speedily, weight for weight, will it dissolve—that it is all a matter of superficies. No cyanider would, I think, doubt this any more than some eight years ago he would have doubted the statement that generally the stronger the solution of the cyanide the quicker would any gold therein dissolve. However, as I have before remarked, "the chemistry of the cyanide process is full of surprises," and I think that another surprise awaits our cyanider here. Thus, if to any one of those blue- or red-coloured liquids of Faraday's, containing gold diffused through them in extremely fine particles, he adds sufficient alkali to feebly alkalize it, and afterwards adds thereto, say, three volumes of a 0·3 per cent. solution of the cyanide, he will find that, as a rule, there will not be a complete dissolution of the gold until five minutes have elapsed; and he will further find that the disappearance of the gold—*i.e.*, the discolouration of the fluid—is progressively slower as the operation goes on—that the last traces of gold linger, as it were, in the liquid in a very marked manner, instead of vanishing from sight in an abrupt manner, as we should expect. These were, at any rate, my experiences of the matter, and I took great care to prevent either any excess of auric chloride or any compound of phosphorus interfering with the experiment.

In a test experiment I made for comparative purposes I had a square inch of gold-leaf dissolved, and the solution of gold resulting was then decomposed and made up to 6 cubic inches of the gold fluid; and the gold in this fluid was found to be dissolved by three volumes of the 0·3 per cent. cyanide in five minutes. Now, were the gold-leaf I took only divided by the precipitating-agent into cubes of the same thickness as that of the gold-leaf — say, $\frac{1}{280000}$ in.—the speed of dissolution should, if regulated by the extent of gold superficies exposed to the cyanide, have taken place in about one minute, because the same kind of gold-leaf that I used in this case was dissolved as in its oxygenated state in eighteen minutes, and by the same stock solution of cyanide that I used for my former test. The gold-leaf, therefore, as thus divided, is three times longer in dissolving than the gold-leaf was. But it is certain that the gold has been much more finely divided than this; therefore it is certain that the retardation of the dissolution of gold by such a division of it as we have in these solutions, or, rather, auriferous liquids, is very much greater than the results of these calculations show; consequently the rate of dissolution for similar areas exposed is still more in favour of the leaf-gold. The fact should be noted that it is the finely-divided gold which is, of the two, the most liberally supplied with oxygen.

As an abundance of time is given at the mines for dissolving fine gold, the fact I have here described does not concern the cyanider, and I only give it as being of possible interest to the chemist.

To present a complete record of all the experimental results that since my report to the Mines Department I have obtained in my investigation of the chemistry of the cyanide process, I insert here the following extracts from the Twenty-ninth Annual Laboratory Report, 1894–95:—

> 1. In the exercise of selective action of potassic cyanide for gold, when paired with a conducting metallic sulphide, there is only a very slight conservation of that sulphide—so slight, indeed, as to be hardly appreciable.

Now, this is exactly what any one would expect when he considers that the electric current—the very existence of the voltaic pair here—is founded upon an oxidizing process only, the oxidation either of the gold or the potassium of the cyanide by atmospheric oxygen; the gold or the potassium (as the case may prove) being more easily oxidized in this way than the metallic sulphide used. As I have proved (and shall show in due course), the solution of the sulphide in potassic cyanide which simultaneously occurs produces no electricity—at least no dynamic electricity: it melts in the cyanide as sugar melts in water. Whether the sulphur of the ore goes to the basic side of the salt to form potassic sulphide, or to the acidic side to form a radical—sulpho-cyanogen*—it is all the same, no electric current is produced.

> 2. Generally, any salt added to a good working solution of potassic cyanide acts the same as an equal quantity of the cyanide in retarding or preventing dissolution of gold. Sugar and glycerine produce the same effects.
>
> 3. Albumen added to a solution of potassic cyanide of 0·26 per cent., in quantity sufficient to well froth such solution when whipped with it, did not appear to exercise any retarding effect on the dissolution of gold.
>
> 4. Potash when added to an aqueous solution of potassic cyanide does not, as is now authoritatively alleged, destroy the cyanogen of that salt

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* I believe that I was the first to show that the cyanogen of potassic cyanide in dissolving metallic sulphides formed a part of their sulphur sulpho-cyanogen (see "On the Production of Artificial Chromes," Trans. N.Z. Inst., Vol. xxi., p. 360).

by hydrolysis or in any other way, but, on the other hand, conserves it.

Thus we see that, instead of being, as it is termed, a cyanicide, potash is a preservative; consequently the excess of it in the cyanide solution that we are now urgently warned against we need not fear to have. Far better the excess, even to a great excess, than the dedeficiency, even if but slight. There is only this point to consider: that, as potash, soda, and salts generally (see 2) retard the dissolution of gold in potassic cyanide, it is certainly right that no large excess of it should be used.

5. Ammonia, whether in large or in small proportion, decomposes the cyanogen of potassic-cyanide solutions, and this whether it is applied in its combined state, as the chloride, &c., or in its uncombined state.

Here, then, is the cyanicide that the worker of cyanide plants should be warned against—this, the ever-present enemy that he has to contend with, and not caustic potash, one of his best friends.

6. Ammonia decomposes the potassic cyanide of these solutions, gradually taking off the cyanogen as a part of ammonium-cyanide. Salts of ammonia effect the same decomposition.

7. Contrary to what is now alleged, nitrogen does not decompose potassic cyanide and carry hydrocyanic acid off when it is passed over or through a solution of this salt.

These results (Nos. 6 and 7) would seem to show that, in a case where a loss of cyanogen occurred by passing nitrogen through a cyanide solution, such loss was entirely due to the action of ammonia, this compound being frequently present in cyanide solutions that have been made for some time. It is also present in all soils and many rocks, and would be taken up by potassic-cyanide solutions.

8. Ammonia does not, by the aid of an air-jet, carry off the cyanogen from either the auro-, cupro-, or zinco-cyanide of potassium, nor yet from the cyanide of strychnine.

In regard to this, I may state that, as far as I have gone, it appears to me that it is only the cyanides of the alkalies and alkaline earths that are decomposed by ammonia.

9. Hydrocyanic acid does not, as is now alleged, attack gold.

10. Gaseous ammonium-cyanide attacks gold in presence of oxygen very rapidly if the contact takes place in air—the speed being about three times as great as that at which the most potent solutions of the potassic cyanide operate.

11. Mercury and platinum are dissolved, though very slowly, by potassic-cyanide solutions; for mercury at least the dilute solutions are far more potent than the strong ones are.

This is contrary to the teachings of Gmelin; and the fact that platinum is also soluble in the cyanide proves that, wherever this metal exists along with the gold that is won by the cyanide process, it will be found to a more or less extent in the bullion thus obtained.*

12. Auric cyanide is a powerful accelerator in the cyanide process, and this whether it is used in the strong or the weak cyanide solution. Platino-cyanide of potassium is also a powerful accelerator.

It will be seen from this that, once the process of dissolution of gold starts, it is greatly assisted by the aurocyanide thus formed.

13. Mercuric cyanide of potassium, though a rapid accelerator in strong solutions of potassic cyanide, acts as a retarder in dilute solutions.

This, no doubt, is quite contrary to the opinion of the patentee of this salt for the process; but the fact appears that, although the gold quickly becomes amalgamated,* and there is every sign of a rapid dissolution of gold, it is not so. The mercury that has been deposited does not allow the gold to go into solution at all freely, nor, indeed, does it entirely go before all the mercury thus deposited has also dissolved. The process is, as I have said, really retarded instead of being accelerated, and this because mercury takes longer to dissolve in the cyanide than gold does, being, as it is, the more negative of the two metals.

14. The bichromate of potash (patented as an accelerator for the cyanide process) is considerably inferior to the ferri-cyanide of potassium in this respect.

15. Ferri-cyanide of potassium is, as the patentee of it states, an accelerator in the cyanide process, reducing, as it did in my experiments, the time about half.

DETAILS OF CERTAIN OF THESE EXPERIMENTS.

(1.) Two pieces of covellite (a mineral representing the copper-sulphides) of the same shape, size, and weight were placed in separate cyanide solutions of the same strength, volume, and shape. One of these pieces was connected voltaically with a gold plate, when, after the lapse of two hours, both the pieces of covellite were nearly dissolved, and I could only detect a very minute difference in the weight of their residues in favour of that piece of covellite that had had contact with gold. The weight of each piece of covellite was 6 gr.; that of the gold dissolved was $\frac{1}{4}$ gr.

Clearly, then, covellite is but very slightly conserved by being voltaically connected with gold; it is only conserved so for as this: it does not oxidize. Still, all the time it is, as it were, quietly melting in the cyanide solution, without producing any electric phenomena that we can detect.

The covellite that I used for this experiment I prepared in very thin translucent sheets or films upon glass by the process that I published a few years ago in the Transactions N.Z. Institute, Vol. xxi., page 361. Films prepared in this way may be had of precisely the same thickness, and absolutely pure.

(8.) Doubting the accuracy of the statement that nitrogen gas driven through a potassic-cyanide solution decomposes it and carries off the cyanogen, I tried the effect of this gas on a solution of the cyanide of 10 per cent. After two hours I tested the solution, and could not observe any loss of cyanogen by the colour test in the ferro-cyanide process. I then tried the effect of nitrogen, as admixed with oxygen in the air, in conjunction with ammonia, when, in five minutes, all the cyanogen was carried off from the solution.

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* Since this report was written I was informed by Mr. Park, F.G.S., late Director of the School of Mines, Thames, that he has found mercury in some quantity in the cyanide solutions that form with the tailings where mercury is present.

* This process was invented by myself in 1876 (see Trans. N.Z. Inst., Vol. viii.), and it was proposed by me as a good test for minute grains of gold in its matrices.

Now, as a current of air driven through an ammoniated solution of bicarbonate of soda only reduces this carbonate to the monocarbonate, the affinity of cyanogen for the alkalies is less than that of carbonic acid for these bodies.

Notes on the Bromo-cyanide Process.

This process was first invented by Dr. Gaze, as an "improvement on the cyanide process," and consists in bromodizing a part of the cyanogen present in a cyanide solution before applying it therein. Now, this is a real invention, and it could only have been made after much careful research in a direction that required a fair acquaintance with the laws of chemistry, and so is very creditable to Dr. Gaze, as an experimentalist in science, and he certainly deserves a reward for his "improvement," if it can be successfully applied. But, unfortunately for him, his improvement necessitated the use of cyanogen, an article which, both singly and in all its combinations, had already been patented by the patentees of the cyanide process—a process which some people think should never have been patented, as being a patent for an application only—a patent for the sole use of a principle known long before, and with not the least trace of invention on their part in it. This is said despite the opinion of the bench of learned Judges who sat upon the cyanide case recently in England, and in concurrence with the view of Mr. Justice Romer, who tried the case in the lower Court. But, however the rights of this may be, these are the points that I have ascertained in the bromo-cyanide process:—

(1.) That when strong solutions of potassic cyanide are bromodized they act with even greater rapidity on gold than potassic cyanide does upon gold that is polarised;

(2.) That, in the good working solution of the cyanide, bromodizing has but very little accelerating effect, if, indeed, it has any at all — certainly far less than ferricyanide of potassium has;

(3.) That a well-prepared solution of this agent has but an extremely slight effect on cupreous sulphides;

(4.) That gold, even when sulphurised, is speedily attacked and dissolved by this bromodized cyanide solution.

These results show that the bromo-cyanide process, also variations of it with other haloids, seems especially applicable in those cases where the gold to be extracted is coarse or is admixed with metallic sulphides—cases where the ordinary cyanide process either completely fails or is not at all satisfactory.

On the Position that Cyanogen holds in Relation to the Simple Radicals, and its Inability to combine directly with Silver or Gold. (By William Skey, Analyst to the Mines Department.)

[Read before the Wellington Philosophical Society, 26th August, 1896.]

Abstract.

In this communication I refer to the fact that in 1874 I gave a paper to this Society entitled "On the Analogy of Cyanogen to Oxygen,"* in which I endeavoured to show that this compound radical should not, for certain reasons that I stated, be classed, as it now is, with the haloid elements chlorine, bromine, and iodine, but rather with oxygen; that, in fact, it is only when it is united with sulphur that we have a radical at all comparing with the elements here named. This theory when circulated in England did not meet with any favour—not that the facts I adduced in support of it were at all questioned, but that others were put forward which, as was stated, conflicted with them. Not then having any further facts to adduce I let the subject drop; but just recently, owing to the question assuming considerable importance, I took it up again, and I have, as a result, discovered further evidence, which, as I believe, is greatly in favour of my theory, and which I adduce. I therefore state this evidence, which is to the effect that cyanogen does not, as it is at present supposed, dissolve either silver or gold when administered to it as an aqueous solution, whether these are dilute or concentrated—that, indeed, as far as I have at present investigated the matter, cyanogen does not even attack either of these metals at all.

The exhibits 1 and 2 on the table here show a little silver- and gold-leaf that have been in a strong solution (aqueous) of this gas for five days, and, for comparison, pieces of silver- and gold-leaf, from the same sheets respectively, that have not been in the solution. I do not think any one can discern any difference in the appearance of these—that is, any loss of either the gold- or silver-leaf that has been in the cyanogen; and I think that you will allow that this is a very severe test in the case of gold, when you consider that its thickness is not more than $\frac{1}{170000}$in. To get a still more crucial test I have coupled gold-leaf with chalcopyrites in the solution of cyanogen (as you may see in the exhibit No. 3), so as to have the benefit, the stimulating effect, that we get by allowing any electricity produced by chemical action to become current electricity. Still, you may see the result is the same; the gold remains, as far as we can see, *absolutely unaffected.*

In all these experiments I feebly acidulate the cyanogen solution to counteract the decomposing effect produced by atmospheric ammonia or the alkali of the vessels that I use. Thus I completely avoid the production of gold-dissolvers—that is, the alkaline cyanides, which otherwise would interfere with the accuracy of investigations of this nature.

Light does not appear to act on these solutions of cyanogen, at least so as to produce any solvent for gold, such as ammonium-cyanide.

I then assert that cyanogen gas, like oxygen, is far more soluble in water than in saline solutions generally that have no chemical effect on it, but that, as it now appears to me that this is a general character of gases, I do not count upon this fact to aid me in my contention. I then go on to state, in regard to the position of this compound radical among the elementary radicals, that, wherever this is, it cannot be with the group of chlorine radicals, owing to the non-acidity of its hydride in water, the composition of its acidic compounds with oxygen, and lastly, as here shown, its refusal to unite directly with certain metals.

I then, in conclusion, state the position I would take in the controversy that I started, and it is this: that, while not disputing the correctness of the general opinion that cyanogen stands in close relation to the radical carboxyl, in which case it is monoatomic, and so comparing with the chlorous radicals, I still maintain that it is on certain occasions diatomic, and so comparable with oxygen. It has, in fact, as I believe, a varying atomicity or quantivalence, according to the nature of its environment.

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* Trans. N.Z. Inst., Vol. vii., p. 379.

As you are aware, this compound can assume allotropic states—that is, like oxygen, it can combine with itself—and an intercombination such as this might, I think, give us cyanogen in the form of a "dyad"; but this is a matter that requires further consideration.

It is only right that I should inform you that Professor Black, of the Otago University, has proved by a series of experiments which are practically contemporaneous with mine that if cyanogen does dissolve gold it is only at a very slow rate as compared with the action of potassic cyanide on this metal. However, as it appears that a very suggestive query that I proposed bearing on this matter started these experiments, I feel sure that this gentleman will, with his accustomed magnanimity and feelings of good-fellowship for his brother-workers in the field of science, concede to me the position of leader in this investigation.

FURTHER RESULTS SHOWING THAT FREE CYANOGEN DOES NOT DISSOLVE OR EVEN ATTACK GOLD. (By WILLIAM SKEY, Analyst to the Mines Department.)

[Read before the Wellington Philosophical Society, 7th October, 1896.]

The scientific and other interests that attach to the statements I made before the society a few weeks ago, that free cyanogen does not attack gold, has induced me to continue my investigations on the subject by the application of tests of a more severe character even than those were upon which I based this statement.

I should premise the description of the results of this further investigation by informing you that soon after the paper referred to was read I learned that Mr. Park, late lecturer at the Thames School of Mines, had made a series of valuable experiments on the subject, in which he used the gravimetric method for determining whether there was not a dissolution of gold by aqueous solution of this gas.

The results of these experiments do not confirm the correctness of this statement of mine (that cyanogen is unable to dissolve gold), but, still, they clearly show that, at least, solutions of this gas do not dissolve this metal at all readily. Mr. Park informs us that he performed his experiments with a button of pure "parted" gold gently hammered to a coherent spongy mass of about $\frac{1}{8}$ in. in diameter, and weighing 0·340 grain. This button was placed in an aqueous solution of cyanogen, and the containing vessel loosely covered. Upon again weighing this button, at intervals of twenty-four hours, he found there was generally a loss of about $\frac{1}{330}$ of its weight at every weighing—that, in fact, about $\frac{1}{1000}$ gr. of gold dissolved per diem.

This does not appear to be a great loss: still, it is very much more than I should have anticipated, but, knowing that the most recent works on chemistry to hand in the colony decide that cyanogen in water alone does not decompose to substances solvent of gold, this scientist could not support my contention as he desired to do.

It was this unsatisfactory state of the case that induced me to make further researches in the matter. Now, as you are aware, cyanogen is a substance that in the presence of even minute traces of ammonia or potash is decomposed to form alkaline cyanides which are solvent of gold, and when once this action starts it proceeds with ever-increasing rapidity. The atmosphere of a laboratory in full operation is frequently alkaline; the vessels used for receptacles in chemical work are capable of yielding alkaline matter to cyanide solutions. For these reasons any experimental results obtained in a laboratory are likely to be misleading.

It is evident, therefore, that any method which requires considerable periods of time, such as the gravimetric method does, is not well adapted for this kind of research; one is required that will speedily give reliable results. Eschewing, therefore, the use of even the hypothetical just balance as an abomination in this case, I adhered to my old method, which is that of testing by sight alone whether any loss of gold does occur by the action of free cyanogen. For this I merely replaced the gold-leaf of my former experiments by gold-paper, which is a Swedish filter-paper, in which gold has been chemically precipitated in a very finely-divided state. A sample of this test-paper is tabled here for exhibition, and the red tint of its gold is easily perceptible in this paper, $\frac{1}{10}$ in. square, by contrasting it with the same kind of paper that has not been so treated. A few short statements showing the extreme tenuity of the gold in this paper may be interesting.

A square inch of the paper contains $\frac{1}{10000}$ gr., and $\frac{1}{10}$ in. square contains $\frac{1}{1000000}$ gr. of gold. Were the gold in this paper agglomerated to a film having a like area with that of the containing paper, that film would be only $\frac{1}{50000000}$ in. thick—that is, 250 of these would be the thickness of gold-leaf. In the paper itself (being, as it is, $\frac{1}{120}$ in. thick) this film (of the $\frac{1}{50000000}$ in.) is broken up to occupy a volume 400,000 times that which it occupies in the form of a film.*

It follows, therefore, that the gold in this paper, volume for volume, only weighs half as much as hydrogen gas.

Broken up in this manner in the test-paper before you, it is in very truth fine gold—in fact, gold divided almost to its ultimate atom (if, indeed, atoms do exist)—gold in the cloud form, as it were, and therefore in the best condition that I know of for my purpose. Provided with a test so delicate as this is, we get results in an hour that, using the gravimetrical test for loss, would require several days; and so we avoid those errors that are apt to creep in and vitiate our results when long periods of time are required for experiments of this nature.

Placing, then, in a porcelain vessel a strong aqueous solution of cyanogen, along with a little of this gold test-paper, I closed the vessel down air-tight, and on examining at periodic intervals I found that even after the expiration of six hours, corresponding to sixty-two days for gold-leaf, there was no visible diminution of the colour of that test-paper. After this, however, the tint gradually faded, until in thirty hours it had quite disappeared. Thirty hours to dissolve the millionth of a grain of gold so finely divided as this gold was shows that, if cyanogen itself does dissolve gold, it is only at an extremely low rate—at such a rate that ordinary gold-leaf would require about one year to become entirely dissolved therein.

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* The method for accomplishing this is given in the "Transactions of the New Zealand Institute," Vol. xxv., p. 383.

Now, this result is a very different one to those that I am faced with both by Professor Black and Mr. Park; still, while it is clearly shown that for gold-milling the gas cyanogen as a direct solvent is useless, it does show that there is an infinitesimal dissolution of gold either by cyanogen or its derivatives, and in the interest of exact science the question has to be decided which of these it is.

Now, the cyanogen I used, though very carefully prepared, had a slight acid reaction; it contained traces of ammonia, hydrocyanic and hydrochloric acids, and this even when to avoid producing them I used the protochloride in place of the bichloride of mercury; and I may further state that the solution of this cyanogen kept persistently acid even when it was three weeks old and much of the gas decomposed; and, what is more singular still, the solution was far more solvent of gold at that time than just after it had been made. It was therefore apparent to me that it is not *any* degree of acidity in a cyanogen solution that does, as is now supposed, conserve this gas—it is not a mild acidity that is always effective for this purpose. So I increased the acidity of the cyanogen solution by adding to it a few drops of hydrochloric acid, and tried another gold test-paper therein, when I was unable to detect, even after the lapse of seven days, the slightest change of tint had been produced upon that test-paper. Hydrochloric acid had not any retarding effect upon the dissolution of gold in weak solutions of bromine.

For supplementary and confirmative evidence on this point I next passed cyanogen gas through a weak solution of nitrate of silver, to wash out any ammonia, hydrocyanic and hydrochloric acids contained therein, and the purified gas was then allowed contact with the gold test-paper both as gas and as aqueous solution of it, when I got results altogether confirmatory of those obtained in the previous experiment—that is, no perceivable effect was produced on the test-papers by seven days' contact. Subsequently I extended the time of contact to three months, but even then failed to discern any loss or change upon the gold.

The results of these various experiments, taken collectively, appear to be positively overwhelming in favour of the correctness of the assertion I made before the Society last month—that aqueous solutions of free cyanogen have not the least solvent power upon gold; consequently they support the old contention of mine cited in the former paper, and alluded to here—that cyanogen does not, as is now generally supposed, compare with the haloids chlorine, bromine, and iodine chemically—that, in fact, except that it appears to be a monad with these and a dozen or so more of the elements, it has no chemical relations to any of them.

I should inform you that the gold I used for the experiments here detailed, also for those for my former paper to the Society, was practically pure; at least, it only contained minute traces of copper. Argentiferous gold, of which class most or all our native gold is, would, of course, if possible, be still less amenable to solutions of cyanogen than the gold I used, and for the reason that argentic cyanide, if formed at all, would always remain as a product quite insoluble in such cyanogen solutions.

That cyanogen would have very little tendency to form by its decomposition solvents for gold as used upon quartz, &c., at the gold-mines appears to me absolutely certain, as both air and water are generally acidic, and all the reef-quartz I have tested also gives an acidic reaction.

MEETINGS OF BRITISH SHAREHOLDERS IN NEW ZEALAND COMPANIES.

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New Hauraki Gold Properties (Limited), Coromandel.

THE annual general meeting of the New Hauraki Gold Properties (Limited) was held on the 20th December, at Winchester House, Old Broad Street, London, Mr. F. G. Lane presiding.

The Secretary (Mr. W. J. Lavington) read the notice convening the meeting.

The Chairman said,—Gentlemen, I regret to inform you that our chairman, Mr. Henry Wilson, was taken very unwell on Friday, and his medical attendant forbids him coming out-of-doors. I trust his illness will be a light one, and that we shall soon have him amongst us again. (Applause.) On looking at the accounts and the report, although I cannot say that we have got anything substantial from the property, I think we may congratulate ourselves on the fact that we are twelve months nearer success than we were this time last year. I do not know whether I need particularise the items in the accounts, but it is satisfactory to find that, after an expenditure at the mine of £4,317, we have a balance in hand of £11,663. We have an asset of 160,000 shares of the Success Gold-mine, which we ought not to take any account of until we are in a position to realise them. Still, we have a substantial balance in hand, with a mine thoroughly equipped with all necessary machinery, and which is now progressing in development to a very satisfactory point. I say "satisfactory," because we have driven levels thousands of feet in various directions to meet with certain reefs, which we have intersected and found at the shallow depths were not sufficiently profitable to be mined. Now, however, at the north-eastern section of our property we have found a reef which, in the words of our agent, "is one from which you may expect very great results. (Applause.) In driving on this reef from the east to the west we have found the lode, having all the necessary concomitants of a good productive lode in depth. We have driven on the lode a considerable distance, and the evidences are that this lode, upon deeper working and further development, will be one from which we may soon anticipate favourable results. We have now cut and driven the level at the 270 ft. Our intention is to rise up and develop it by certain levels at various distances, and, looking at the character of the reef, being in splendid rock, and being what you may call a strong fissure vein, 4 ft. wide, we think that our prospects there are exceedingly bright." Our agent has informed us that all our developments in the northern part of our property tend to help us to cross-cut in any direction where there may be a chance of meeting with discoveries in adjoining properties. In the property adjoining us, called the Karaka Block, they have met a very splendid reef. The property has been described there as being extremely valuable, and this reef has been traced up to our boundary and 20 ft. within our ground. The width of our sett is very extensive; therefore, should this reef, as we believe it must, go through our property, and be anything as productive as it shows in the adjoining property, there is something which we cannot attempt to realise the value of. (Applause.) Our cablegrams assure us that from the developments we have made we can cross-cut to intersect this reef at various points, and that it will be done at a minimum cost. Now, the development of this reef alone would make this property an extremely valuable one, so that we have not only two lodes to consider and develop, but we have other reefs in other parts of the property which we shall also use our best efforts to develop. A cablegram received to-day has assured us that, by extending the No. 3 cross-cut at the 80 ft. level, the 270 ft. level, and other points, we shall prove the strike of the line of the Karaka Reef and recent discoveries. The adjoining property, the Karaka Reeef, has, I believe, lately been floated with a capital of £150,000. Now, we must have that reef, which must go through the entire length of our property, and you can draw your own conclusion as to what the value of our property would be if this reef, which intersects it, is found to be productive. I do not see why it should not be so. It has been found to be productive up to the boundary of our property, and I do not see why it should fall off in value when we are in as good rock, and the ground is of a thoroughly mineralised character. I cannot think that for a moment. There are two particular points I have now to draw your attention to in the report of the directors as presented to you. I would call your attention, too, to a paragraph in the report of the manager, where he says, "The character of this reef is analagous to the rich lodes of the Success in its early history." Gentlemen, these are the thoughts which are impressed upon one's mind by the manager. That is all I can say. I can only hold out to you the hope of an early success, and I think that if we continue the developments, as has hitherto been done, in a very spirited manner, you will have no cause to regret your investment in this company. I have now to propose, "That the directors' report and statement of accounts, as circulated, be received and adopted." (Applause.)

Mr. E. W. Lane seconded the resolution.

The Chairman: We wish to give you every information, and we shall be glad for you to criticize our proceedings in any form you wish. I think that criticism on the part of shareholders towards directors is a right and proper course to adopt at meetings. We only meet you once a year, but in the meantime we give you every information received in the shape of cables and reports. We have our regular cost-sheets, which are examined and particularly noticed. We are working this mine economically, because we do it by levels. We have no pumping, our deep levels preventing the necessity for having to pump the water. (Hear, hear.)

The resolution was then put and carried unanimously.

The Chairman next moved the re-election of Mr. Henry Wilson as a director. No one attended to the business of the company with more rigid punctuality than he did, and he could always be found at the offices of the company. (Applause.)

Mr. Bumpus seconded the motion, which was put and carried.

The auditors (Messrs. Ogden, Palmer, and Langton) were also reappointed.

On the motion of Mr. Catterson, seconded by Mr. Bumpus, a cordial vote of thanks was passed to the chairman for presiding, and the meeting separated.

Success Gold-mines (Limited), Coromandel.

The annual general meeting of the shareholders in the Success Gold-mines (Limited) was held at Winchester House, London, E.C., on the 20th December, Mr. F. G. Lane presiding.

The Secretary (Mr. W. J. Lavington) read the notice convening the meeting.

The Chairman said,—Gentlemen, you have had the directors' report and statement of accounts, together with the manager's report, in your hands for some days, and perhaps I should, in the first place, explain why this meeting has been called so early. We now only present to you accounts dealing with a period of ten months; but, as we found that most of the shareholders in the New Hauraki Company were also members of the Success Company, we thought it prudent that we should call the two meetings for the same day. I feel sure, however, that the more frequently the accounts are presented to you the better pleased you will be. I will also point out to you that, the accounts being for only ten months instead of the usual twelve months, we are able to present to you the statement of affairs up to the latest possible period. As regards the accounts, I do not know that I can add anything to them, except to say that the expenditure in New Zealand has been made upon work which has been well done. As you will see by the statement of the manager, the work of developing the mines has been of great magnitude, while, at the same time, the cost has been very light. The reason for this is that the development of your property from the deep levels requires neither pumping nor hoisting machinery. The fact is that all the ore is carried down to the deep level, and from there it is trammed direct to the battery, thus obviating the necessity of providing winding machinery. Another advantage of this deep level is that it drains the property, and consequently we are able to work upwards instead of downwards. You will see in the accounts that the expenditure in New Zealand amounts to £5,108, whilst the receipts for the sales of gold have been £1,612, and for sundries £25, making a total of £1,637. Deducting this from the amount expended at the mine, you will see we have remitted from this side the sum of £3,471. The London expenses, exclusive of interest paid on deposit and the registration fees, amount to £515. Then, at the bank we have on current account £326, on deposit account and interest £3,590, in transit to New Zealand £700, and in the hands of the manager £89, making our total assets in cash £4,700. This, gentlemen, is the position of affairs at the present time. We are well equipped with a good battery of twenty stamps, and we have a fair sum of money with which to carry on our future developments. Our levels are being driven upon the various reefs in such a manner that we expect any day to meet with good results. In fact, a telegram has come to hand to-day to the following effect: "Stoping has been continued steadily on Jubilee No. 1 and No. 2 and Success No. 1 reefs. Appearances never better than at present time to meet discovery. Total amount crushed 8 tons; result 37 oz. of gold—bullion value, £108." This is a very small amount, but we are in this position: We can cross-cut in so many directions, as you will see by the drivages we have made, that we may meet with a discovery at any time. The Success Mine in the past has been a wonderfully rich one in the upper levels, and we have now got down to a point where we can rise up against those portions of the mine where the discoveries were first met. I cannot say when we may meet with any good deposit of gold, but we have got a large number of men at work in all directions, and any day one of their pickaxes may be put into a portion of the mine where a discovery may be made that will be of great importance to us. As you know, in the past the old company made large returns from the shallow levels, and I do not see why we should not in the near future make good returns from the deeper levels. We are utilising our money to the best advantage, and so conserving our resources as to enable us to fully develop the property at as small a cost as we possibly can. Under these circumstances I trust you will accord your support to the directors. You may take the report of the manager as one in which your directors have every confidence—they believe it to be a truthful one, that the anticipations contained therein will be soon realised, and that we shall all be satisfied with the result. I beg to propose, "That the directors' report and statement of accounts be received and adopted."

Mr. E. W. Lane seconded the motion.

A Shareholder: Can you tell us whether the discovery in the Karaka Block is likely to affect our position in any way?

The Chairman: I must tell you I do not know whether the discovery in Karaka Block may run through the Success property at such a depth as will enable us to come across it in the present developments. There is no doubt it will be found to go through the Success property, but I believe it will be found at a deeper point than we are at present working. Where, however, you may look for a great improvement is in the new lode in the New Hauraki property—the north lode—from which our manager expects great results when it is found in the Success Mine. We shall be able to intersect this lode by driving short cross-cuts.

The resolution was carried unanimously.

The Chairman: I have much pleasure in proposing the re-election as a director of your chairman, Mr. Wilson. I proposed the same resolution at the New Hauraki meeting, and I can only repeat what I then said—that a better chairman or a more honest gentleman to study the interests of the shareholders does not exist.

Mr. Bumpus: I shall be very pleased to second that resolution.

The motion was then agreed to *nem. con.*

The auditors (Messrs. Ogden, Palmer, and Langton) were reappointed, and it was also resolved that the expenditure on the mine up to date be written off to the capital account.

The meeting terminated with a vote of thanks to the chairman and directors.

Golden Pah (Hauraki) (Limited), Coromandel.

The ordinary general meeting of the shareholders in the Golden Pah (Hauraki) (Limited) was held at Winchester House, London, E.C., on the 20th December, under the presidency of Mr. F. G. Lane.

The Secretary (Mr. W. J. Lavington) read the notice convening the meeting.

The Chairman said,—It is now about eighteen months since we caused this property to be formed into a separate company as a portion of the Hauraki Company. Now, the Hauraki, as you know, has been, and is still, a very profitable undertaking, but the site was too large for the property to be developed by the Hauraki Company, and hence it was deemed prudent, acting upon advice from the other side, to form a separate company, and this company was formed, with 500,000 shares of 2s. 6d. each, or a total capital of £62,500. We paid for the property to the Hauraki Company, in cash and shares, £30,000; the expenses since acquiring this property, in machinery and in works underground, amount to £11,020. The expenses in London—I will take the whole, because if there is any question in regard to the expenses we shall be very glad to answer it—have been £1,343, and the assets, shown by cash at bankers, deposits, and cash in hand, are £15,781. That is your asset at the present time—£15,000 odd. Now, you would like to know what we have done with the remainder. You have a statement here of the expenses in New Zealand. If you read the report now in your hands you will find that a very considerable amount has been done. The shaft that we began to operate upon was nearly filled with *débris*, woodwork which had fallen in, and so on, and we had to commence operations from the surface. We lengthened and widened the shaft so as to make it a permanent shaft for the development of the property, and that was done down to about the 80 ft. level. There we had a large quantity of water to contend with, and your manager utilised the best means he could with the machinery in the district, so as to clear the shaft of the *débris*, to widen the shaft, to fix proper timber, and to prepare for the machinery which was to be sent from England. All that was done in a very short time, so that by the time the machinery ordered here in England was sent out they were fully prepared to use it, and in a very short space of time the machinery was set to work at your mine, and operations commenced with deepening the shaft. This work has now been carried out to the 180 ft. level — that is, the 180 ft. below the adit — that is 25 ft. The operations of the adit have taken a very short time, and we shall be able now, from our present depth, to drive 80 ft., 130 ft., and 193 ft. levels. These are points of very great interest. The lode we have at the present time, and from which we are getting some return, is called the Jewellers' lode, but from the levels to which I have referred we hope to be able to intersect several other lodes. This Jewellers' lode has turned out productive to us, and has given us a good insight into what the other lodes that have since been discovered or are known to exist there are likely to be. The Duncan lode is a lode from which we also expect very good results. It is a lode—not a small one—which is running in exactly the same direction—in fact, taking precisely the same course—as the Hauraki No. 2 lode, a very rich vein, runs. Now, should this reef turn out in any manner as productive—and not only our agent, but we ourselves have hopes that it will—as the Hauraki No. 2, you may look on this vein as one of very great promise to the interests of the shareholders of this company. There are other veins, but we have not had an opportunity of exploring them properly, the quantity of work which has been done having been so great. The people at the mine have been so thoroughly employed, and have had to get down to the shaft at a very bad time of the year, and the work has been pressed forward in order that we might be able to present to you a reasonable report, which we trust will meet with your approval, as to what we have been doing. I do not know that I can say a word more in appreciating or in upholding the interests of this company to your particular notice, except to draw your attention to the concluding remarks of your agent and manager, Mr. Francis Hodge, who says, "We have now practically started to work the mine on a fair basis, and, judging from what I have seen of the various reefs and the character of rock in which they traverse, with the facilities we have now perfected to develop them, warrants me, or would warrant any one knowing the locality, in saying that the mine will eventually prove of great value to the shareholders. I must remind you that the character of reefs in Coromandel when encountering a chute of gold is exceedingly rich. In this particular property we are not confined to one of these reefs, but we have many; so that, while we develop more or less the whole of them, our chances are very great indeed. I can assure you that I am looking upon the Pah as a valuable property. It must not be forgotten that any day we may cut a similar patch of gold to the Hauraki, and, once done, the interests of the shareholders within a very few days will be at a very high premium. It is unlike taking years to open up a large reef with low-grade ores, and the laying-out of extensive plants to deal with it, and various other difficulties. We are in the position now, when once we cut a rich chute of gold, to immediately turn out profits for the shareholders. Let us hope that this will eventuate at an early date." I think with these remarks, which are the words of your manager, I will conclude, for they require no more words from me. He is not asked to make a report to gratify the market or alter the price of the shares in any way; he is simply instructed to send us the results as they appear, and to give us, if he pleases, besides, his opinion of the working of the mine. We have to-day received a cable from him, and this should also be interesting to you, as a proof that our mine is now, and will be, a very valuable one: "The present depth of the shaft is 193 ft. below the adit; now sinking for fork; the character of the rock excellent; anticipate very good results from the 193 ft. level; operating on Jewellers' and Pah reefs; the ore is moderate; total amount crushed, 20 tons; the result is 71 oz. gold, bullion value £218. From the general outlook I am of opinion that future prospects are excellent." Well, gentlemen, this is the statement that I can make to you in all confidence of its being faithful and correct. I do not wish to colour it in any shape or form, but I simply ask you to pass the resolution, which I now formally move, "That the directors' report and statement of accounts be received and adopted."

Mr. S. Goldsmid seconded the resolution.

A Shareholder: The company has only £15,000 in cash now, and I should like to know how we shall be able to put the stamps down to the mine?

The Chairman: We have plenty of money in hand, and we shall always be pleased to have instructions that stamps are required. In that case we shall be able to return you something from our present workings. We are not going to put down any stamps or waste any money in unnecessary machinery until we know we have stuff to crush. We are crushing at the present time on the Hauraki stamps. We are not going to spend any more money in a reckless way for the sake of spending money. We look at the money now in our hands as money to be conserved in the interests of both ourselves and the shareholders.

A Shareholder: With reference to the lode running in the same bearing as the Hauraki, is it in the same line or parallel?

The Chairman: It is a parallel lode.

A Shareholder: I should like to know whether the Hauraki is thinning out or not. I happen to be an unfortunate shareholder who bought very high. I paid 17s. for my shares, and that is very hard.

The Chairman: I will answer that when this motion has been carried.

The resolution, on being put, was carried unanimously.

The Chairman: As regards the Hauraki, it is not done with yet. This is but a child of the Hauraki. The Hauraki has another mine connected with it called the Union Beach, and that is a very profitable mine, but it is in another property, and this will help us considerably in helping to drain the water which we shall get presently, so that we must not desert the Hauraki, even if the shares are low and have been high. We look to the Union Beach to help us in case of water, and by so assisting each other we save a great deal of expense.

Mr. Alten moved the reappointment of the auditor, Mr. E. H. R. Trenow, at a remuneration of thirty guineas.

The motion was seconded and agreed to.

A vote of thanks to the chairman and directors concluded the meeting.

Blagrove's Freehold Gold-mining Company (Limited), Coromandel.

The annual general meeting of the shareholders in Blagrove's Gold-mining Company (Limited) took place in Winchester House, London, E.C., on the 20th December, Mr. F. G. Lane presiding.

The Secretary (Mr. W. J. Lavington) read the notice convening the meeting.

The Chairman said,—Gentlemen, the accounts, as you will observe, are for twelve months ending 30th June. We were not prepared before this time to come before you with the good prospects that we had been led to expect with regard to the development of the mine. However, our last intelligence is satisfactory, and we are now in the position to report to you that the mine has been proceeded with and developed in a very satisfactory manner. Our chief object has been to push on the deep level from the main shaft to connect with a shaft that has been sunk on our eastern boundary, and from which we have obtained very good results. This main level has been driven a considerable distance (nearly 400 ft.), and in conformity with the Mining Act we must have two outlets for deep workings; but from the good prospects that we now find in the eastern ground we have determined to sink the shaft to a depth of 200 ft. to commence with, and to open up from various points at the shaft. Now we have several levels going, or being proceeded with, in prospecting upon the main shaft, all of which have shown evidence of production, but we cannot say that we have had anything of any material value from them as yet. We have now concentrated our efforts to pushing on with this main level, and, as we have a complete set of machinery now, both for pumping and driving, we intend to sink our main shaft 200 ft. deeper, and we hope, and fully believe, from the encouraging prospects that we continue to receive from our managers, that we shall be enabled to present to you very soon something like substantial results from these operations. There is no portion of any ground that we have passed through but what has been what may be called very favourable in character, and very promising for good results. The ground itself is good, but these good results as aforesaid have not yet come in; still, our opinion is that we may daily expect something very good. For instance, if we take the line of reefs, say, from the Royal Oak right down through Tokatea, right down through Blagrove's, we find the channel-ground is one which is very similar to that of the Royal Oak. The developments there have proved very satisfactory. We fully believe that we shall have similar results in the operations we are now carrying on in Blagrove. I will go through the accounts. The capital called up, as you will perceive, is £62,400, and there are sundry creditors to the amount of £292. On the other side we have the amount paid in cash and shares, as per contract, for the property, £37,500. The amount written off last year to capital account was £6,940. The expenditure in New Zealand comes to £8,059, which I think will show you that we have been continuing operations there upon a very extended scale. The London expenses come to £714; and we have cash at bank, £4,000; in India rupee paper, £5,530; and in hand of manager, £13: making a total of cash of £9,543. I do not think that there is anything in those accounts that can call for any criticism on your part. We have conducted the affairs of the company in as economical a manner as we possibly could. We have studied your interests as well as our own, and I hope and trust that you will accept of these accounts, and the directors' report, and pass them with unanimity. We have to-day received a cablegram, but I do not think there is anything in it worthy of much comment. It states that the manager is doing everything he possibly can in the development of the main lode, in order to hasten the matter. The prospects, it states, are decidedly encouraging, the main cross-cut making good progress so as to connect the workings with the eastern shaft. From all the accounts to hand, I think that we have very good hopes of having a profitable property before very long. With these remarks I beg to propose "That the directors' report and statement of accounts, as circulated, be received and adopted."

Mr. Cecil Hartridge seconded the resolution, and said when he was on the property recently the mine was being properly developed, but they could not get along very fast because of the want of machinery. The machinery had now been erected, and therefore the mine had a very fair chance indeed of development in the immediate future. They were all aware that the share-market at the present moment had an exceedingly gloomy aspect, but they ought not to consider the value of the mine by the price of the shares. They knew that in these times of depression when an offer of 100 shares was put on the market the prices realised were considerably less than would have otherwise been the case; whereas if they had to go to purchase 1,000 shares the opposite would be the result. There was a great deal of development to be done before they would be justified in erecting a battery, and the directors had set their faces against the purchase of such apparatus before they got sufficient stuff to crush.

A Shareholder: How much money have we left in hand for development?

The Chairman: A little over £5,000, after paying costs up to the 8th January.

A Shareholder: That means practically that if we have not a result in about a year our resources will be running short.

The Chairman: That may be so, as the expenses run to between £500 and £600 a month.

The resolution was then put and carried.

The retiring director, Mr. Henry Wilson, was re-elected, as also were the auditors, Messrs. Bolton, Pitt, and Breden, and the meeting concluded with a vote of thanks to the Chairman.

Kathleen Crown (Limited), Coromandel.

An ordinary general meeting of shareholders in the Kathleen Crown (Limited) was held on the 22nd December at Winchester House, London, E.C., the chair being occupied by Mr. H. Wilson.

The Secretary (Mr. A. J. Lavington) read the notice convening the meeting.

The Chairman, having appealed to the indulgence of the meeting, as he was suffering from a slight indisposition, said,—The documents relating to the business we propose transacting to-day have been in the hands of the shareholders for the usual time. I refer, of course, to the directors' report and statement of accounts, and the report from the local manager of the mine. Although we had nothing very startling to tell you in these documents, we were in a position to state that the development of the mine on all points was turning out in such a manner as to warrant the belief that after a little further development has been done the mine will open up as well as we ever expected it would. Perhaps the most important announcement we have had to make was that at a depth of 60 ft. from the surface we cut an important lode, which was then supposed to be Argall's lode —a lode which turned out to be Argall's lode, and has since been cut in a drive from the 200 ft. level. That lode was cut on the 30th October last. There was another important lode, which gave still better assays, and, if you recollect the map which was issued with the prospectus, you will see that this property is on the borders of Blagrove's Freehold. This property consists of upwards of 90 acres, being also freehold, but a portion of it was taken from the Blagrove's property equal to 20 acres, which made up the quantity of some 92 acres. Judging, therefore, from the results of the developments and the cutting of Argall's lode, going by assay between £3 and £4 per ton, also the cutting of what we call No. 2 Blagrove's lode, running into the Thompson Section of this mine, going between £5 and £6 by assay, our property must be regarded as having very favourable features. I think that if you have carefully read and considered the statement made by the local manager you will be in a position to draw a very favourable conclusion as to the future of our properties. I would also ask you to remember that their existence has been but brief up to the present time, because for the first four months there was really and truly nothing to be done in the way of mining. That period was spent in preparing the ground for future operations, and the nature of the ground was very embarrassing—roads to be levelled and made, respecting which we have been in communication with the Government in order that we may be in whole or in part paid for the expenditure on these roads. In connection with the mines in the North of

New Zealand there has always been great difficulty with the roads, by which the machinery in nine cases out of ten was seriously delayed. We have approached the Government not only in connection with this mine, but in regard to many other mines on the North Island, with a view of inducing them not only to expend more money on road-making, but also to recoup the various companies who have expended money on public works which go principally for the benefit of the Government. (Hear, hear.) Until your mines are well developed we are entitled to look for some financial support from Government, seeing that this is the most important industrial enterprise in the whole of the North Island. (Hear, hear.) As regards the progress that is being made in the development of the property, at present there is really little remaining for me to tell you—with the exception that our present object is to develop the various lodes which it contains. In the first place, the objective point of all our operations has been to cut and seize a big lode, which is known as Argall's lode. The next is to develop Thompson's Section on the northern portion of the mine, and it may be necessary to sink deeper down to the 300 so as to get thoroughly underneath what may be considered as rather an unfavourable body of country just now, our operations having been very much interfered with by the intrusion of hard andesite. Hard andesite is not a congenial bed for gold to live in—in fact, it is rarely, if ever, found in it. What is desired is decayed or partially-rotten andesite, which, in the opinion of the local managers, is the most favourable country you can have. As to extending our operations still deeper, that is a matter we are considering at present, in conjunction with those upon whom the local management devolves. It will not cost very much money, nor will it take much time; but at present we consider it more prudent to apply our best energies to the development of the ground we have already partially opened up, inasmuch as we have a belief that the ore, both in Thompson's Section and that seen already in Argall's lode, exactly corresponds with the ore in the Hauraki. (Applause.) Well, if we get abundance of that in quantity we shall be thoroughly satisfied with the quality. As regards the policy it is suggested we should pursue in the future in the development of your property, I think it will be advisable to draw your attention to some of the last paragraphs in the report, which brings us up to quite a recent date in regard to the mine. Mr. Argall says, "The opening-up and developing a new mine is always attended with a considerable amount of preliminary or dead work, and in this mine the locality in which it is situated has necessitated a great deal of clearing and road-making on the mine, leaving out of account altogether the approaches to the mine; but I am glad to say that in this respect the County Council has responded to our appeal, and contributed to our necessities in this matter." Then he alludes to the large amount of earth which it was necessary to remove in order to make a road for carting coal and other material for use on the mine. The engine started on the 5th March, and since that time a great deal of anxiety has devolved upon the local management. There has not been the slightest reason to take exception to anything which has been done on the score of delay, and you will understand perfectly well that, although the duties of directors are purely administrative, it is to the energy, intelligence, and economy of the local management that we must look for results. We on this side can do little more than control them, and impel them on to further exertions. I think it would be well to refresh your memory in connection with the local manager's report. He says, "If I may be allowed I would like to anticipate the future operations. I think it would be well, in the first place, to thoroughly develop the workings at the 200 ft. level, and then resume sinking, as I consider it highly probable that in another 100 ft. the hard andesite country will break away, and give place to the more congenial decomposed andesite, in which it is an undeniable fact the most favourable reefs are known to exist. We are working now in very hard country, and in this district it has been demonstrated beyond doubt that gold-bearing reefs in such a country soon lose their productiveness. It is not at all unlikely that I may suggest at no distant period that a supplementary shaft be put down on Thompson's Section, where there is every reason to believe that gold-bearing reefs exist, and it would facilitate matters considerably by sinking." He says in the concluding paragraph, "In concluding my remarks I would like to put on record my opinion, which is that, with the number of reefs on the property, many of which carry gold, the ultimate issue cannot but be of a satisfactory kind, especially when we remember that the position of the mine is in a direct line with the belt of country running from the Kapanga to the Hauraki and the Beach Mines." Now, that may be interpreted as pointing to the possibility of another company being formed to work a portion of the property. I may as well tell you that such a course has not in any way been contemplated by us. We appear to have sufficient funds to work the property, and, as far as our present opinion is concerned, there is not the slightest intention of forming a subsidiary company, although 92 acres is a large holding. The balance-sheet may seem to some of you a rather startling document, but I would ask you to bear in mind that it covers the whole period from the date of initiating up to the present time. Practically the balance-sheet is for a period of nearly two years, and I would draw your attention to some of the items which may appear to some of you to be extravagant, but many of them will not occur again. The items of carriage, freight, &c., plant and machinery freight to Auckland and erection, prospecting Thompson's Section, legal expenses and fee—these will not occur again, and they amount to £4,100. As regards the expenses in London, you will also observe that some of the items may appear large, but be good enough to remember what I have already told you as to the period of time which they cover. On the other side of the account you will see a sum which represents calls unpaid. At the present time matters are not very favourable to calls being paid, and as we have every reason to believe that the amount in question is perfectly safe we have given the shareholders—most of whom I know personally—as much latitude as we possibly could. (Applause.) The Chairman concluded by moving the adoption of the report and accounts.

Mr. J. A. Travers seconded the motion.

The Chairman, in answer to a question, said,—There is no stamping plant at the present time. Proceeding to answer further questions, the chairman said that the ore was free-milling ore. The company had no stamps at the present time, nor did they intend to erect stamps until they had proved whether there was sufficient gold-bearing ore in the mine and at hand to keep those stamps going. It was one of the greatest blunders that directors of public companies frequently committed in connection with mining properties, that they spent a large amount of money on stamping machinery before they knew whether there was a sufficiently large amount of ore developed to keep them going. At the present time they would go on developing the property, and they would be able easily to get sufficient milling accommodation to crush whatever ore they might possess.

A shareholder asked whether the company had sufficient working capital.

The Chairman said they had nothing to buy except milling machinery, and they had provided themselves with quite sufficient plant to carry them down in depth. The working capital justified the belief that they had quite a sufficiency of money to carry on the mining operations. If Argall's lode justified the expectations which they were impelled by present indications to form of it, they would soon be getting gold towards their expenses. (Applause.)

A shareholder, in proposing a hearty vote of thanks to the chairman and directors, said he had never seen a mine which, in his view, had been so ably and economically worked as theirs. The management had had a great deal to do, and, so far as the economy was concerned, the mine had been most admirably worked. It was highly satisfactory for them to know that really good gold-bearing quartz had at last been discovered. The very valuable assays which had been made were a reward for the manner in which the company had stuck to the enterprise, and he had no doubt that this view would commend itself to the great body of shareholders. (Hear, hear.) He should have been very pleased to find fault with the management if there had been any ground for criticism—(laughter)—but as things had been carried out he had absolutely no reason to make any complaint.

The Chairman then put the motion for the adoption of the report and accounts, which was carried unanimously.

The Chairman then moved, "That the amount expended in London and New Zealand, as shown in the balance-sheet, amounting to £14,065 7s. 10d., be written off to capital expenditure."

Mr. Hardie seconded the motion, and it was carried unanimously.

The auditors (Messrs. Tronow and Heisch) having been reappointed, the proceedings terminated in the usual manner.

Royal Oak of Hauraki (Limited), Coromandel.

An ordinary general meeting of shareholders in the Royal Oak of Hauraki (Limited), Coromandel, was held on the 16th December at Winchester House, London, E.C.

Mr. Cecil Hartridge, who presided, in moving the adoption of the report and accounts, said the Board might justly congratulate the shareholders upon the satisfactory condition of the company's finances. The amalgamation with the Tokatea had been a great advantage to both companies, and the gold which had been discovered in the Tokatea had turned out to be highly satisfactory. Captain Hodge recommended the Board to acquire immediately another 10-stamp battery, and there was an opportunity for the Board to acquire one on exceedingly favourable terms. The company were considering the advisability of acquiring certain plant, and for that purpose it was probable that the water-races would be utilised for power.

Mr. J. E. Rush seconded the motion, which was carried unanimously.

Mr. Witheford, one of the original vendors, said he had not in many ways been in accord with the system of development as practised by the management, but a certain amount of satisfactory results had followed upon the work which had been done. He advocated a greater use of the natural advantages which were connected with the property, which would greatly decrease the cost of working. He did not think there was a better man than Captain Hodge anywhere, but he had his own opinions, and considered it better to express them candidly. (Hear, hear.)

The proceedings terminated in the usual manner.

Kauri Freehold Gold Estates (Limited).

The ordinary general meeting of the shareholders in the Kauri Freehold Gold Estates (Limited) took place on the 17th December, at Winchester House, London, E.C., Mr. P. G. Hamilton Carvill, M.P. (chairman of the company), presiding.

The Secretary (Mr. Alex. H. Singleton) read the notice convening the meeting.

The Chairman said,—Gentlemen, since the incorporation of the company a great deal of development work has been done, but as monthly reports from your superintending engineer, Mr. Montgomery, have been regularly furnished, and as, accompanying the directors' report, the shareholders have now Mr. Montgomery's summary of all the work done in the year, it is, perhaps, unnecessary that I should go over the same ground at great length. You have no doubt carefully read all that Mr. Montgomery has written, and you have probably formed conclusions for yourselves as to whether the results have or have not been satisfactory. To my mind the results have been perfectly satisfactory; and we also now know that in many other parts than those upon which mining work has been concentrated gold-bearing reefs are very numerous, and there is every reason to believe that further developments will show these reefs also to be of a payable character. From the information given to you at our last meeting it is no doubt a disappointment that no subsidiary companies have yet been formed, but it is well known to every one connected with mining that for the last year the public were not investing, and that mining properties, however excellent, were not in demand. I cannot say that this has been an unmixed calamity, or that under the circumstances your board desired to follow a course in any way different from that which they have pursued. Their policy has been, and is, to give the public the utmost confidence in any property sold or recommended by the Kauri Freehold Gold Estates, and, if I may say so, I think this is a wise and far-seeing policy. For instance, we are now developing twelve square blocks of about 90 acres each; these, one and all, will be far advanced and thoroughly proved when the public are asked to invest in them. In this way, when we have commenced, we hope to bring out a succession of companies at once highly profitable to you, and at the same time offering sound and safe investment for the public. The subsidiary companies so brought out will be connected by tramway with the central battery, which it has been decided to put up, and they will only have to stope out the ore already in sight, and continue further developments. Thus, at any rate in the early days of these mines, the heavy outlay on separate batteries can be postponed or altogether avoided. Of the twelve blocks before spoken of nine are in and around the Opitonui Valley, and three are in the Owera. The area of the mining ground and the reefs being worked are quite sufficient for several large companies, but it will depend on financial arrangements still in view what can be done to the greatest advantage of the shareholders of this company. Outside of these twelve blocks we are working the old Lillis Mine at Te Ranga; and we are developing some promising reefs in the Waitekauri Valley, along which, the greater part of the way to Whangapoua, there seems to be a network of reefs more or less valuable. In answer to a cablegram sent a few days ago, worded as follows: "Annual meeting will be held on the 10th December; advise by telegraph important developments in good time"—we have just received a reply, which, you will see, is highly satisfactory. It reads as follows: "Engineer reports prospects of Maiden Mine are very favourable; 4 ft. of ore in the face, ore from the mine for the last month assaying £5 6s. 9d. Carvill's Reef, about 3 ft. in present face; assays, £2 13s. Work on the winze shows the lode is 6 ft. wide; assays, £18 17s. 6d. Hilda Cross-reef is 2 ft. wide; value, £8 10s. Australasia Reef at No. 1 assays £9 10s. 9d. Reef has been struck in the second level showing gold in the pan; not yet assayed. Lillis's Reef is 12 in. wide; value, £1 13s. 7d. Prospectors have discovered another reef in Waitekauri Block. Reef is 3 ft. wide; value, £16 2s. 6d.—an entirely new discovery. Prospectors have discovered another reef in Waingaro Valley, showing free gold. Castle-rock Reef is 16 in. wide; value, £2 8s. 6d. Owera Mine, No. 3 level; Reef is improving." It will be seen that in the Maiden Mine there are two reefs of great value. The Maiden Reef, which has been very promising throughout, has 4 ft. of ore in the face, assaying for the last month £5 6s. 9d. per ton. I think that is a most promising and valuable asset. The Carvill Reef has still 3 ft. in the face, but the assay is down to £2 13s; still, of course, very payable. This reef "faulted" a little while ago, and, although it has not got back to its original high value, it is satisfactory to see that by means of a winze, which at another point has been sunk upon it, the lode is known to have increased to the width of 6 ft., with an assay-value of £18 17s. 6d. per ton. Then, again, in the Waitekauri Valley, quite outside of the twelve blocks before referred to, another reef has been discovered, 3 ft. wide, giving the high value of £16 2s. 6d. per ton; and in the Waingaro Valley there are reefs which we have every reason to expect will prove the making of several good mines. New Zealand as a mining field may not be much in fashion just at present, but people who have been out there, and who have inspected the Kauri Estates for themselves, do not need any convincing as to the great value of this property. I have been out there for six months, and I have been on every foot of your ground where work is being done. I believe in the property. Mr. Welstead, another of your directors, will second my motion; he has also made more than one complete inspection of the estates, and I hope he will give the shareholders the benefit of his opinion. I know that he thoroughly agrees with me, only I think I may say he is a little more enthusiastic. There is another gentleman, a New-Zealander, who has been recently in this country, and he, speaking with intimate local knowledge, has given our board the strongest possible assurance as to the high value of the property; he has done more than this, he has also expressed his wish to invest £5,000 of his own cash in our first subsidiary company. I mention this as a strong testimony as to the value of the property owned by this company. You will see on this map that the site selected for the central battery is so placed as to be convenient to the Opitonui Mines, and at the same time within easy communication of the many other mines that we hope to see successfully opened up in the Waitekauri Valley, and in the Waingaroa Creek, of which I have spoken before. We cannot hope to develop all this property ourselves, but by means of the central battery which we have in view we shall encourage other companies to come and lend us a hand on terms which, I feel confident, will be mutually profitable. The natural facilities for mining—at least, on this part of our property—are very great indeed. The battery will be within three miles of the company's own deep-water wharf in Whangapoua Harbour, with which, as you know, it is being connected by a tramway. We have every advantage as to timber and as to water-power; our mines and battery will be easily accessible; and we shall have as cheap and as good labour as there is to be had in New Zealand. Another important point I should mention is this: In no other place that I know of or have heard of in that country will the cost of mining be as low. All our reefs, except, perhaps, the Maiden, are of very friable quartz; the ore is free milling, the bullion is of high value, and with wet-crushing—for which it is believed to be suitable—the cost of mining and milling should not exceed £1 or £1 1s. per ton. Not being a mining expert myself, it may be thought that I have ventured too far on these technical points; but I am giving you not only my own opinion, but the opinion of other people residing on this property, and perhaps I may say of Mr. Montgomery (whose reports are sent to you regularly) that what he tells you can be accepted with the most perfect confidence. He is a most competent and careful man, perhaps over-cautious, but you may think him all the better for that. This I do pledge myself to: So far as I have been able to gather information, so far as I know human nature, Mr. Montgomery's reports may be accepted without the slightest discount. (Applause.) I now move, "That the directors' report and accounts, as submitted, be adopted," and, when this motion has been seconded, if the shareholders desire any further information the board will endeavour to satisfactorily answer any questions that may be put to them.

Mr. Leonard Welstead: I have very great pleasure in seconding the motion that has been proposed by the chairman. In his remarks he has directed nearly the whole of his attention to the Whangapoua district; but, of course, you are aware we have other blocks in the Thames district. These blocks have already been proved to be valuable, but they will be proved to be of still greater value in the future. At the present time not very much work is being done on them on account of the very large quantity of timber which covers the surface, but this will be cleared in due course by the company, and further prospecting work will be carried on. I have been over all the properties; in fact, I was there at the same time as Mr. Carvill. I was also on the properties before the company was formed, and therefore I was able to notice the great changes that have since taken place. At the Opitonui Mine everything is being carried on in a most energetic way, and the reefs that have been opened up are all proving valuable. As the chairman states, I am rather more enthusiastic than he is, but I think I have every reason to be so in view of recent events. (Hear, hear.) To show you to some extent that my enthusiasm is not entirely misplaced, if you take the assays made, which you will find in the report, you will see that the average of twenty-one of them is £13 10s. per ton. The remainder of the assays, which amount to forty-six, average £3 17s. per ton; while if you take all of them together—sixty-seven—you will find that they give an average of £6 17s. per ton. In view of the fact that so many assays have been made I think you can take this average as really the true contents of the reefs when they are fully opened up for milling purposes. I do not see how we can arrive at the actual value of the property in a more easy and satisfactory manner. Then, again, in the last cable we have received the results of eight assays are given us, and they come out at £8 2s. per ton, which is an increase on what we have had before, and I think you will agree that as the reefs are opened up in the lower levels they will continue to improve. When a certain amount of quartz is opened up by means of these reefs we shall be able to float a subsidiary company to extract the gold, and I think that a company could not be floated under more favourable conditions. You will have a certain amount of ore opened up which will give you a certain value, and all the new company will have to do is simply to take it out and turn it into gold. We shall not say to subsidiary companies, "Oh, yes, you can go and prospect on our property," but we shall do it ourselves, in order to make sure that the company will be a sound financial success before the public are asked to subscribe the necessary working capital. I think this is a sound way of doing business, and I am quite sure that the whole of the board are of the same opinion, and that the shareholders will have confidence in us if we only continue on the same lines. The machinery site which we have chosen is near the Whangapoua Harbour, and there is a downward grade to this point from the whole of the district. Therefore the cost of bringing the ore to the battery will be very small indeed—I should think not more than 6d. per ton. There is plenty of water to work the battery if desired, but we shall also have to consider the question of providing electric power by this means. As to the Owera Mine, this is being rapidly opened up, and there has been proved a long shoot of gold which goes from the mine and is being traced into the Otanguru Valley. When I was there small trenches had been made which had cut the reef, and all the samples taken showed gold. One of the samples taken from the reef in the mine itself gave a most extraordinary value, and, although most of the assays taken from the mine have not been quite so satisfactory, it is merely a matter of getting into quartz that will give us a little better value. Of course, as the mine is further opened up we shall develop, we hope, ore which will give a better yield. I do not think I have any other point to mention, except to say that I have the greatest confidence in the property myself, having been all over it and seen everything there is to see. I always thought it was a good property, and I believe that time will prove it to be so. With regard to Mr. Montgomery, the superintending engineer, I am pleased to be able to indorse every word of the chairman as to his capabilities. We have a most able man in him, and we can confidently look upon him as being most reliable, as he will not make a statement which he thinks after events will not bear out. (Applause.)

The resolution was then put and carried unanimously.

The Chairman said the next business before them was to appoint an auditor. Mr. Charles Fox had acted in the past, and they had no reason to put forward why he should not be re-elected.

Mr. George Freeman said he had great pleasure in proposing that Mr. Charles Fox be re-elected auditor for the ensuing year at a remuneration of fifteen guineas.

Mr. Charles de Pass seconded the resolution, and it was carried.

On the motion of Mr. Charles de Pass, a hearty vote of thanks was accorded the chairman and directors.

The Chairman briefly acknowledged the compliment, and the proceedings terminated.

United New Zealand Exploration.

The first annual ordinary meeting of the United New Zealand Exploration (Limited) was held on the 15th November, at Winchester House, London, E.C., Mr. W. F. Turner in the chair.

The Secretary (Mr. Alfred W. Berry) read the notice convening the meeting.

The Chairman said,—In the absence of Mr. Wichmann, our chairman, who is abroad on business, it falls to my lot to preside to-day, but as the report we have to submit to you is of so cheerful a character the duty is an agreeable one. The report and accounts which we have the pleasure of submitting to you to-day have been duly circulated amongst the shareholders, and have appeared *in extenso* in the newspapers. Copies are also on the table, and we will therefore take them as read. I need not refer to the circumstances under which the company was formed, as these were explained in detail at the statutory meeting in July of last year. Our balance-sheet, which is made up on the 30th June, 1897, is of a very simple character. It shows an issued share capital of £149,000, and share premiums received amounting to £21,750 (*i.e.*, a premium of about 15 per cent. on the total shares issued), together £170,750. We had practically no liabilities, the exact amount being £16 5s. 2d. Turning to the assets side of the account, you will find, cash at banker's, £23,067; loans on security, £51,008; and debtors, £10,403. These three items make a total of £84,478, of what may be called "liquid assets," and represent a proportion of over 55 per cent. of the issued share capital. A very large portion of the loans and debts has since been received; consequently these assets are in a more liquid form to-day than at the date of the balance-sheet, and our cash balance is very much larger. The investments, £73,188, stand in the balance-sheet at cost price. Some have since been realised at a profit. The most important consideration to bear in mind in regard to this item is that we have in the course of our business acquired large holdings of fully-paid shares in certain companies which are not brought into our investment account or into our balance-sheet in any way; consequently the item "investments" must be taken to represent a much larger value than appears on the face of our balance-sheet. We are quite aware that in many companies of a similar character to our own it is the practice to enter in the balance-sheet all profit shares at par or some other arbitrary price. Were we to do this we should have greatly increased our assets on paper, and have presented a profit and loss running into large figures. Such a method of stating accounts is apt to prove delusive, and we prefer to state the facts and to await the realisation of our various interests before submitting a profit and loss account. As regards the next item, "Expenditure on properties and options, £9,000," I may say that since the incorporation of the company we have had submitted to us in London and New Zealand a very large number of properties in various parts of the colony. Our engineers have been almost incessantly occupied in the examination or development of properties so offered, with the result that most of the options have been relinquished. Thanks to the care and discretion shown by our advisers, the expenditure on abandoned options has been comparatively small, and the greater part of the item we are now dealing with represents expenditure in connection with certain properties which have excellent prospects, and which we believe will in due time result in substantial profits. That item may therefore be regarded as a good and promising asset. The general expenditure in New Zealand may at first sight look rather large. The details are sufficiently indicated, but I may point out that it covers a period of sixteen months, and that the nature of our business, extending as it does over both islands, necessitates the employment of a large engineering staff. This item of expenditure is considerably reduced by engineering fees earned in connection with companies whose properties we manage. It may interest you to know how our engineering staff is distributed. Mr. Gordon, as chief engineer and general manager, makes his head-quarters at the company's offices in Auckland; Mr. Park is at Thames, where he has the Moanataiari and May Queen Mines under supervision; Mr. John Gow is at Dunedin, on the east coast of the South Island; and Mr. James Bishop at Reefton, on the West Coast. We are thus in a position to deal promptly with mining proposals from any part of the colony. The London expenses include some special items of advertising and the cost of production of a detailed map of the Hauraki goldfields; deducting these, the London expenses are as low as the nature of the business permits. The net balance of our general expenditure in London and New Zealand, after deducting receipts of various kinds, is only £3,779 for a period of sixteen months, which we consider very satisfactory. Perhaps I should mention that the directors have received no fees. In leaving this part of the subject, I think the board is warranted in saying that the company is in an exceptionally strong financial position, its resources have been husbanded with great care, and that this bodes well for our future prosperity. As regards the companies in which we are chiefly interested through our holding of shares or the properties which we have under option, I shall not detain you, because we have the pleasure of seeing here to-day our chief engineer and general manager, who has just arrived in London to confer with the board on important matters of business. I shall presently call upon Mr. Gordon to address you, as he will have the advantage of speaking of the various properties from personal knowledge. I now beg to move, "That the directors' report and accounts be received and adopted."

Mr. Percy Tarbutt seconded the motion.

Mr. Gordon's Address.

Mr. Henry A. Gordon said,—On my arrival in London from New Zealand a week ago your board requested me to prepare some notes on the history, the present position, and the prospects of the principal properties in which your company is interested, and I now have the pleasure of submitting them to you. Taking first the Moanataiari Mine. It is situate on the Thames goldfields, in the North Island. At the time your interests were acquired it consisted of 94 acres, with a mill and tailings site of about 15 acres. We have since added to it the Cambria, consisting of 15 acres. The property, therefore, now consists of 109 acres, and the mill and tailings site of 15 acres. The Moanataiari Mine had in the past produced large quantities of gold, and dividends of about £175,000 had been paid. The gold had been won from comparatively shallow workings, and by more or less primitive methods. The workings had reached a depth of 400 ft. in the western section of the mine. A new shaft has since been sunk, which will admit of the lodes in this section being worked to a depth of 250 ft. below the old workings. The greater part of the ore in the western section had been taken out; in the eastern section the mine had only been partially worked from the surface to a depth of 300 ft., and in the greater portion of this section the lodes are intact. There are thirteen different lodes traversing the property, which vary from 8 in. to 12 ft. in width, and, judging from their inclination, some of these are likely to merge into one another at greater depths. A recent cablegram states that what is known as the Golden Age lode is opening out very satisfactorily, and that the grade of ore in other portions of the mine shows prospects of improvement. From the Cambria property, which lies between the Moanataiari Mine and the May Queen Mine, dividends have been paid in past years to the amount of over £80,000. The Mariner's lode, in the Victoria property, from which in former times gold was won enabling the company to pay £67,000 in dividends, underlies into the Cambria section, and will be found in the Cambria ground at the lower levels. As to the character of the ore in the Moanataiari Mine, it is, generally speaking, of low grade, interspersed here and there by nests and bunches of rich ore. The irregular distribution of the gold in the ore-bodies renders it extremely difficult, and almost impossible, to obtain a fair idea of the value by sampling and assaying. The records of the mine from February, 1889, to October, 1895, show that 51,124 tons of quartz yielded gold worth £78,603, or £1 10s. 9d. per ton obtained. In 1893 Mr. James Park, at the instance of the New Zealand Government, made a number of experiments at the Moanataiari battery, and treated about 630 tons of ore to ascertain the percentage of gold saved by the treatment then in use. These experiments showed that the best extraction obtainable by the means then existing was less than 55 per cent. of the assay-values. On this basis the total value of the ore would be £2 16s. per ton, from which only £1 10s 9d. was recovered. During that period no occurrences of gold of exceptional richness took place; consequently it may safely be assumed that the results obtained represented the general average of the mine at that time. The old forty-stamp battery taken over was practically useless. The new battery consists of sixty head of stamps fitted with rock-breakers, self-feeders, and all other necessary appliances. It will be capable of treating about 240 tons of ore a day. Power has been provided for the increase of the battery to 100 stamps. It was originally expected that the mill would be completed in July of the present year, but the contractors have had many difficulties to contend with, the principal one being the difficulty in obtaining timber. When I left New Zealand on the 2nd October the work was so far forward that unless unforeseen delays occur it should be completed in the course of next month, and crushing should commence very early in the new year. When the mine was taken over it was in a most dilapidated state ; the main adit and some of the levels had to be retimbered and new roadways laid down before further development work could be undertaken. At the present time about 75,000 tons of ore are developed, which should keep the mill running for twelve or fifteen months. As to the value of the ore, it is difficult, as already stated, to give definite figures ; but, in view of the higher extraction which will be obtained by the new plant, I anticipate satisfactory results, irrespective of the occurrence from time to time of richer bodies of ore, as has been the case in the previous history of the mine.

The next property I have to refer to is the May Queen, in which a very large interest is held. It consists of 184 acres in the heart of the Thames Goldfield. It adjoins the Moanataiari on the north, the Victoria and Cardigan on the west, and the Queen of Beauty on the south. This, in my opinion, is the richest mine on the field. Complete records of the yield of the gold exist from 1881; from that date to 1896 gold to the value of £152,000 has been produced, equal to about £3 per ton. In this case also the gold-saving appliances were very defective, the highest percentage recovered at the battery being only about 52 per cent. of the assay-value. Since July, 1896, about 510 tons of ore have been treated at the old mill, and have yielded gold to the value of £1,600, being £3 2s. 6d. per ton. This agrees almost exactly with the result obtained during the period of about seven years before mentioned. The property is traversed by four distinct reef systems, the reefs varying from about 2 ft. to 10 ft. in thickness. The greatest depth obtained is about 452 ft., and the ore has been proved to be richer as greater depth is obtained. Work beyond that depth in this mine, as in other adjoining mines, was stopped by the heavy flow of water, which there was no means of coping with. The Thames-Hauraki Company, which owns the adjoining Queen of Beauty and other mines, is sinking a pumping-shaft to drain the whole of this part of the field, the Government contributing £25,000 towards the cost. The work is expected to be completed in about six months' time. The May Queen shaft will be connected with the pumping-shaft by a drainage-level, and when the water has been pumped to a depth of about 600 ft. there will be available about 150 ft. of backs on the lodes in the Saxon and May Queen sections of the mine. It is intended to construct another drainage-level at a depth of 750 ft. It is practically certain that the lodes will continue to a great depth, and on that basis I calculate that when the mine is down to a depth of 750 ft. there will be available about 280,000 tons in the May Queen and Saxon sections, and 120,000 tons in the eastern portion. The latter section will have to be drained by ordinary pumping appliances, as it is outside the drainage area. From the position of the May Queen Mine in the Thames Goldfield, its geological character, its history, and from my knowledge of its present condition, I have the greatest confidence in its future, and the consequent prosperity of the May Queen (Hauraki) Company. The latest information by cable is that stoping has begun on No. 2 Cardigan lode, and that the ore will average about an ounce of gold per ton.

Your company also holds a three-fourths interest in the Cardigan property, which consists of about 64 acres, adjoining the Victoria property on the north, the Saxon and sections of the May Queen on the east, and the Queen of Beauty on the south-east. It is a deep-level proposition, and has not been proved to any extent. There are six reefs traversing the property, but only two of these can be worked until the Thames-Hauraki drainage-shaft is sunk to a greater depth. Considering its position and the very large quantity of gold won from the May Queen and Queen of Beauty Mines in former times, we are warranted in counting on this property in due time producing satisfactory results.

Turning now to the South Island, we hold large interest in an option over the Barewood property, situate at Barewood, in the Otago Mining District, comprising 516 acres, which takes in about two miles and a half of the line of reef. This is now being actively developed, and the results are so far very satisfactory. The reef has been proved by three different shafts, about 60 chains apart, to contain ore of a value of about £2 per ton. Since taking up the option the reef has been tested to a greater depth in one of the shafts commenced by the vendors, and as far as yet proved the lode maintains its size and value. An ample water-supply can be got for motive-power to work machinery, and the position of the mine is such that it can be worked very economically. We have recently taken an option on very satisfactory terms over a property known as Kirwan's Reward, on the Victoria Range, in the Reefton district. There are four claims, comprising an area of 190 acres. On one of these claims, known as the Lord Brassey, there is a large deposit of quartz covering the surface for an area of about 8 acres. It consists of stones and boulders weighing from a few pounds up to blocks of about 2 tons, and the greater portion of these show visible gold. I estimate the total weight of these loose stones and boulders to be about 3,000 tons, and that they will yield about 2 oz. of gold per ton, equal to gold worth about £20,000. The property is situated at an elevation of about 4,000 ft., and this surface deposit must have been brought by a slip from a higher portion of the range. The reef has not yet been located, because, until recently, the ground has been covered with snow. One of our engineers is now at the property prospecting for the lode, and should this be discovered it will undoubtedly be one of the largest and richest enterprises in the colony. Several reefs are known to exist in other portions of the property, and, taking it as a whole, it is the most promising find I have known during the thirty-five years I have been engaged in mining in New Zealand. We also hold an option over the Britannia Mine in the Westport district, in the South Island, consisting of 100 acres ; the Lady Agnes and Carson's Reward, situate at Mokihinui, on the west coast of the South Island, comprising an area of 200 acres ; and we have under offer seven properties of 100 acres each on the Upper Paparoa, in the same district as the Kirwan's Reward, of which I have spoken. Mr. Bishop, one of our engineers, writes that at least four of these properties have a good show, and are well worthy of being tested. I think I have said enough to show you that since the formation of the company the engineering staff has not been idle. We have examined large numbers of properties in various parts of the colony, and, as might have been expected, have had to reject most of them. We remain, however, with valuable properties in hand, and others which give promise of value. I can assure you that the expenditure which has been incurred has been undertaken with the greatest care and caution, and that in the properties I have mentioned you have valuable assets from which you may expect in due time to reap substantial profits.

The resolution adopting the report and accounts was then put and carried unanimously.

The auditors (Messrs. F. J. Searle, Smith, and Co.) were reappointed at a remuneration of thirty guineas.

Mr. Percy Marsden, in moving that the sum of £1,000 be awarded to the directors as a remuneration in respect of their services to the 30th June, 1897, said the directors had passed through a very difficult time in regard to New Zealand business. They had, however, maintained the company in a strong financial position whilst transacting a large business in New Zealand; the prospects from their properties were excellent, and he thought the directors were entitled to the best thanks of the shareholders.

The resolution was seconded and carried unanimously.

The Chairman returned thanks on behalf of the board, and the proceedings then terminated with the customary votes of thanks.

Puriri Gold Estates (Limited), Thames.

The first ordinary general meeting of the Puriri Gold Estates (Limited) was held on the 11th December, at the offices of the company, Dashwood House, New Broad Street, London, E.C., the Hon. J. F. Vesey Fitzgerald (the chairman of the company) presiding.

The Secretary (Mr. T. R. Archbold) having read the notice convening the meeting,

The Chairman said,—Gentlemen, as you are aware, this is the statutory meeting of the company, held in pursuance of the Act of Parliament, in order that we may tell you what progress has been made since we were registered. Of course, there are no accounts to lay before you, but the object, I believe, of holding a statutory meeting is to enable the shareholders to catechise the board, and to make any inquiries as to the position of affairs. I have not very much to tell you as to the work which has been absolutely done, owing to the fact that Mr. Gore, who is to direct the development of the property on our behalf, was detained in Melbourne, so that, although we expected long before this that he would have been on our property, we have not, so far, had any account of his arrival. I thought we should have had some news from him by this time, and that I might have been able to inform you that he was on the spot. We believe he is there, but we have not had a cable to that effect. Now, I would like to point out to you some of the advantages in regard to the position of our property, which has a total area of about 224 acres. First of all, the mine is placed in a very favourable locality. It is on the main road from Thames to the Paeroa River, distant about ten miles from the Thames Township, which is a seaport, at which eventually plant and machinery can be landed. The Government are completing the line from Auckland to the Thames, and it will pass about a mile from our property. A station is in course of erection at Puriri, and in addition to that the County Council are making a road from the main road to our property. You will see, therefore, that geographically we are in a very favourable position. The property is on a steep hill, which renders the work by adits very easy, and conduces to its development in a remarkable manner. It is covered with kauri-pine, which is a most useful timber for mining purposes, and which, as we own the freehold, we can get at the expense of cutting down, otherwise it is very dear. Mr. George E. Stephenson, who at present represents the company in New Zealand, and of whom we have the most flattering accounts and the highest testimonials as a mining engineer, wrote in his first letter that he thought all the reports accompanying the prospectus were thoroughly sound, and it only required systematic working to make the property payable. In his letter of the 20th July he says he is convinced from what he can see on the surface that we ought to cut a good reef by driving about 300 ft., more or less, and that in the adjoining mines, the Hit or Miss and the Joker, they have found good gold, and the reefs they are now opening up pass through our property. These are Mr. Stephenson's opinions, and therefore we give them to you. On the 6th August he again writes, "The Hit or Miss adjoins the property, also the Joker and the Amazon. Our reefs have been found in all the claims, and, so far as I can see, there is no doubt about the Puriri property." On the 10th August he again writes, "We are all ready for a start, and I feel sure we shall soon have the pleasure of sending you word that we have cut a reef. As far as we can judge from the surface that desirable event should happen in about 300 ft. of driving, and we know that the reef coming in from the Amazon ground carries payable gold." He further writes, "Mr. Mercer, of Messrs. Bewick, Moreing, and Co., was here on Sunday, and I had a long chat with him about the district in general and about his property—the Joker, Hit or Miss, and Central, or, as they call it, the Empress of India." That is important, as I shall allude to it in future as the Empress of India property. He adds, "From what he says, they have got on a good run of gold in the Joker Section, and, from what I can gather without seeing the plan, it is going straight into our ground." He further says, "I estimate we shall have to drive about 300 ft. to get the reef coming in from the Amazon, which in that claim carries payable gold. When we cut this reef we should have about 250 ft. of backs to work on. Of course, as the tunnel gets further in and the known reefs come to hand the more backs we shall get; for instance, when we get the reef known as the Perseverance we ought to have at least 1,000 ft. of backs." Any shareholders present who wish to inspect the map of the whole neighbourhood may do so, as we have one here, together with detailed maps of the property. About a month later—on the 26th September—speaking of the Empress of India, he says, "In this adjoining mine they have very encouraging results in their low level. I am told that the assays are as high as £7 per ton, and from what I can see I think we should cut the reef they are at present working on in the tunnel I intend putting in." He goes on to say that he is starting a level, which he intends in future to call the Buchanan's level, and he adds, "I am unable to give a proper estimate of cost of this drive, as it depends entirely on the class of country met with; but, judging from the surface, I do not suppose it should cost more than about £1 per foot, including timbering. We should have to drive about 600 ft. to get underneath the Crown reef." In the mine adjoining—and this is important, because, as I pointed out to you before, Mr. Stephenson spoke about the report as to the value of the Empress of India reef; but I have been shown a private letter which he has written to this country, in which he says, "In the mine adjoining—namely, the Empress of India—they have more than a good prospect. They have a reef 22 ft. wide, which assays from £3 10s. to £7 per ton, and I am given to understand that they are more than satisfied. At all events, the reef is there. I have seen it myself, so there can be no doubt about it." That comprises Mr. Stephenson's report, and it is corroborated by the letters which we have received from our advisory board out there. I should point out that on the advisory board we have two of the best-known and most successful men connected with mines in New Zealand—Mr. Thomas Morrin, who is on the board of the Waitekauri United Company, and Mr. James Russell, of the Woodstock Mine. Those two mines themselves are sufficient to carry conviction as to the position of the gentlemen referred to, without mentioning others with which the members of our local board are connected. I may add that Mr. Russell is also president of the Auckland Chamber of Mines. He is also assisted on the local board by Mr. N. Alfred Nathan, a well-known merchant in the colony. I will now read a very lucid and comprehensive letter from Mr. Morrin and Mr. Russell, which fully corroborates the statements made by Mr. Stephenson. It says, "We have to intimate that, as arranged at the local board meeting on the 12th October, we proceeded by steamer on Friday, the 15th, to the Thames, and on the day following visited the company's property at Puriri in conjunction with Mr. R. Kelly, Mr. G. E. Stephenson, and Mr. S. H. Matthews, the local secretary of the company. Having inspected the buildings erected by Mr. Stephenson, we proceeded to examine the prospecting work done by Mr. R. Kelly subsequent to the sale of the property to the English syndicate, consisting of considerable trenching works on different portions of the southern half of the property, and which have proved that several well-defined reefs of various widths existed, running through the length of this portion of the property. As far as we know the value of these reefs has not been ascertained. Most of the trenching work has been done at the lowest point of the property, but up to the present has not been continued on account of the small backs obtainable. At the highest point considerable trenching work has also been done, and several reefs met with. To reach underneath this high part 1,000 ft. would have to be driven through apparently easily-worked ground. Some 400 ft. further on from the high point mentioned a drive at a low level was visited, from which it was reported a considerable quantity of gold had been taken out by previous owners. This drive, under Mr. Kelly's supervision, has been partially cleared out and retimbered where required. We instructed Mr. Stephenson to continue the cleaning out and retimbering, and on reaching the reef to test the size and value of the same. Under Mr. Stephenson's guidance we then proceeded to inspect the work performed under him, consisting of a good 5 ft. track from the buildings mentioned to the spot where he had cleared away timber and undergrowth and located the site for a permanent tunnel. Several kauri-trees had been felled, from which a large quantity of legs, caps, and slabs had been cut for the purpose of timbering the drive. A smithy and tool-shed had also been erected of split timber, as well as the excavation of a powder-magazine, and a place for squaring timber as required. Mr. Stephenson showed us where he had the men at work upon the mouth of the tunnel. This tunnel is intended to penetrate a distance of some 600 ft., the object being to cut through the lines of reef known as the Purple, Waitemata, and Crown. As it had only been commenced on the morning of our inspection we cannot give any idea of the time it would take to complete it or the cost of driving. These facts can only be ascertained after the quality and nature of the rock had been proved by extending the drive for perhaps 50 ft. into the side of the hill. We inspected several reefs outcropping on the surface several hundred feet above the tunnel, and were much pleased with their appearance and the quality of the country surrounding them. There was no evidence of this portion of the property ever having been prospected, and we see no reason why the result of opening up these reefs at a low level should not be highly satisfactory. The northern portion of the property is covered with splendid timber for mining purposes, which is easily obtainable. There are three streams of water running from the hills right through the length of the property, which, though of sufficient volume in summer time for battery purposes, are not sufficient for use as a driving-power. With regard to the southern portion of the property, we think it would be very much to the interest of the company to have a drive or tunnel made from the point, say, opposite the present tunnel, going in a southern direction towards the Joker and Hit or Miss properties. This would thoroughly test the southern portion, and we feel confident would result in disclosing one or more payable reefs. We are much impressed with the prospects of the property as a whole, and are sanguine that the development works in progress and those proposed to be carried out will prove it to be a payable one." I think you will agree with me that these are very favourable reports. I give you this statement on the authority of these reports, and, as far as we know, there is no reason whatever why we should not believe them. I do not know that I have anything further to tell you, but if there are any questions any of you would like to put to me I will be willing, as far as possible, to answer them.

No questions having been asked, Mr. H. B. Macnab moved a vote of thanks to the chairman for presiding.

Mr. E. D. Matthews, in seconding the motion, said he was sure from the facts which the chairman had laid before them that the shareholders must feel satisfied that they had a very excellent property to develop. He expressed the hope that the next time they met, which would doubtless be during the coming year, they would have absolute facts of working to report to the shareholders.

The Chairman having briefly acknowledged the compliment, the proceedings terminated.

Woodstock Gold-mining Company (Limited), Karangahake.

The third ordinary general meeting of the Woodstock Gold-mining Company (Limited) was held on the 17th December, at Winchester House, London, E.C., Mr.

P. G. Hamilton Carvill, M.P. (chairman of the company), presiding.

The Secretary (Mr. Alex. H. Singleton) having read the notice convening the meeting,

The Chairman said,—It is a matter of regret to the board that on meeting you to-day we do not recommend a dividend. You may think that with greater energy this might have been attained, but you must remember that a great deal has had to be done. The opening up of a mine of this character is a big undertaking, and the erection of a 40-stamp battery under the most favourable circumstances must account for a good deal of time. But while it is a great disappointment to me personally that a dividend is not forthcoming to-day, the latest information received, coupled with the personal knowledge that I have of your property, encourages me to say that in my opinion this is the last meeting of the Woodstock Company from which the shareholders will have to go away without hearing a satisfactory dividend announced. (Applause.) We have been making profits from the start, and for the twelve months prior to the 12th June (the date of my departure from New Zealand) I estimated our profits for that period at £4,003 7s. 9d., or, if fifty-two weeks be taken, that the annual earnings would be £17,348, being 10 per cent. per annum, with a carry-over of £2,348. My belief then was that we ought to pay a dividend at this meeting, but other unexpected matters have upset this calculation. I was depending on the returns keeping up, or at least not falling below £3,500 per month, but unforeseen difficulties with our ore occurred, and the returns, as you know, fell off considerably. That these with proper foresight might have been avoided I have now no doubt, but it is not convenient in these matters, even if one could do so confidently, to attempt to apportion the blame; however, I wish to say this: that I exonerate entirely your excellent mine-manager, Mr. McCombie, a gentleman whose thorough competency and devotion to your interest have at all times excited my admiration. I do not wish to refer more particularly to the difficulties that we have experienced, nor is it necessary, for I believe that the whole of that trouble is practically over, and that, benefiting by past experience, there is now, in my opinion, a promise of unbroken prosperity before us. In the report in your hands we were able to state that, up to and ending with the "clean-up" of the 11th September last, 6,665 tons of ore had been treated, and that this had realised £21,410, or an average of £3 4s. 3d. per ton. Taking into account the last three returns ending on the 4th instant, we find that from the start of the mill 9,718 tons have been treated, for a sum of £30,533. For the last two months the amounts are estimated, but in all previous months the value placed upon the bullion by our mine-manager has been more than realised. Now, while under the old state of things profits more or less satisfactory were being made, I believe that with the successful introduction of wet-crushing the whole character of your venture has immensely improved. For some months past wet-crushing, as applied to Karangahake ore, has been on its trial, but has now proved to be an undoubted success. And this, gentlemen, affects your interests to an extent that you may have some difficulty in realising. In our own experimental crushings (which are highly satisfactory, and show that the Woodstock ore is also amenable to wet treatment) the consumption of cyanide is reduced from 8 lb. per ton of ore treated down to 2 lb. per ton, which at the present price means a saving of 6s. per ton. I admit at once that 8 lb. per ton was an unheard-of consumption, but the difficulty was to keep up the extraction with less. All strengths of solution were tested. We knew the cause perfectly. With the wet process slimes were the difficulty, and in the almost unavoidable irregularity in roasting sulphates were formed which simply devoured the cyanide. This has been got rid of, and the cost of drying the ore, which is not less than 2s. 6d. per ton, will be now saved. And to add to all this we have a better extraction than ever before. The last extraction cabled to us is 94 per cent. of gold and 62 per cent. of silver; and if these can be kept up (of which I have little doubt) it means that in point of extraction alone 6s. per ton, instead of running to waste in the tailings, will be saved, and go to increase your dividends. And another point remains to be added—viz., that where you had 1 ton before per stamp per day, we shall have in the future about 1¾ tons—that is to say, instead of the output being 1,000 tons per month, it will be 1,750 tons per month. The cost of mining on this extra quantity will, of course, be as before, but the milling and the fixed charges, both in New Zealand and in London, need not be appreciably increased; and all this you may hope to see accomplished very soon, without any large expenditure; in fact, while other things may be desirable, there is nothing indispensable except greatly-increased vat accommodation. I see Captain Robson, an eminent mining engineer, in the room here to-day, who knows your property well. I remember asking him, not professionally, but as a friend of mine—he is a gentleman for whom every one who knows him has the highest respect—to thoroughly inspect the property and tell me for my own guidance what he thought of it. I know he took his coat off at the job, and later on his report was, "You have a splendid property; more ore over river-level than necessary for the life of the present battery, but also under river-level you have a property of the greatest possibilities, the realisation of which should not be left to a future generation." I am bound to tell you that Captain Robson added, "Why on earth have you not rock-drills?" I had to accept this rebuke. We all know, especially with hard stone such as ours is, that rock-drills must effect a great saving; but, gentlemen, we cannot do everything. Perhaps some of you will think that your directors have invested the capital quickly enough; but all I can say is that if your working capital be now fully occupied we have secured you good value for your money—the development of the mine is very far ahead, and your battery plant is second to none in New Zealand. In addition to the higher levels that might be reserved for the Woodstock proper and its present battery you have deep levels of immense value, and in my opinion it will be the duty of your board soon to put forward a comprehensive scheme for the quicker realisation of the whole property. I came home with the idea that we should form a separate deep-levels company, in which the Woodstock Company should reserve to themselves, say, £150,000, issued as fully paid, in vendor's shares, and I still adhere to that view as the method by which the present shareholders can best anticipate benefits for themselves that are now latent. But some of your largest shareholders, with whom I fully discussed the matter, think, in the first place, that the times are not propitious for such a flotation; and, secondly, that some better scheme can be propounded which will enable deep-level mining to be carried out without the complication of a separate company. However, this need not be regarded as a pressing matter. If I have the honour of remaining longer your chairman, it is one of which I hope to show big results in the near future. Before leaving this question of our deep levels we have, as you know, besides other minor ones, three important reefs—viz., the "Woodstock," "Shepherd's," and the "Maria," and we have ascertained beyond doubt that as these reefs go down they improve in width and in value, and the proportion of gold in the bullion grows greater. Of course, we cannot tell what is in the bowels of the earth, but I have taken the very best advice on this subject; I have brought to the spot the most eminent geologist in New Zealand, and he sees no reason whatever to doubt that these reefs go down indefinitely in the same satisfactory manner, and I must add that we have also a fourth reef in the property which outcrops in a neighbouring mine, and is to be seen for 900 ft. in the face of the Waitawheta Gorge dipping into us with well-defined walls at an angle of 45½°. A shaft is being sunk on this reef by our neighbours, and the lode is already proved for more than 100 ft. below our lowest level, and at that depth it is about 8 ft. wide, giving an assay-value of over £5 per ton; and it has been estimated for me that this reef on entering our boundary will give us, at an economical working depth, an additional million tons of payable ore; and I may mention that there is water-power still unappropriated in the Ohinemuri and Waitawheta Rivers (which converge at our battery) almost to any amount for six months of the year, and that from this source we can rely on 500- or 600-horse power, except during three months of the dry season. While in New Zealand I had a good deal else to do besides mining. There were two lawsuits forced on us in the Warden's Court, and in conjunction with Mr. Welstead I had these fought out, and we obtained a verdict with such costs as could be got in that subordinate Court. I may mention as a proof of the mine-manager's opinion of the Woodstock that he has a very large holding in it. Between himself and his wife they have over three thousand shares, and while I was in New Zealand Mr. McCombie was adding to his holding. He bought 250 shares in Auckland early in the spring at £2 8s. 6d. I may also mention that an old friend of mine, an eminent engineer (Mr. John Green, of Aberystwith), who has had experience all over the world, inspected the mine at my request and for my private guidance, with the result that he bought some hundreds of the shares at £2 9s. It may be said that he did not buy well, but still it is important as showing what he—a man of excellent judgment—thought of the property. The market is wrong as often as the mine, and in this instance it will turn out that it is not the mine that is wrong. In concluding my remarks, it may be thought I should have dwelt at greater length on the details of your property and its working, but you have had the advantage of reading Mr. McCombie's reports, not only his monthly ones, but also his summary for the year, and, speaking for myself, I confirm those to the fullest extent. Finally, I wish to say that with the success of the reforms in hand it will soon be in our power to begin paying satisfactory dividends. I am in hopes that an interim dividend will be announced in July, with something showing still further progress this time twelvemonth. Mr. Welstead, one of my colleagues, who knows every inch of your property, who is a very large shareholder in it, and who takes the deepest interest in its good management, will be asked to second this motion. I hope he will take the opportunity of making up for my omissions. I now move, "That the report and accounts as submitted be adopted." (Applause.)

Mr. Leonard Welstead, in seconding the motion, gave some details with reference to the development of the property, and remarked that from the numerous levels opened up it would be seen that the lode had maintained its width and value down to the lowest point attained. The levels had all been connected with winzes, intermediate levels, and cross-cuts, and an enormous body of ore had been opened up for the mill. The manager estimated the reserves of ore at about 41,000 tons, and he believed that their value would average £4 per ton. The wet-crushing had so far been a great success, and if they adopted this system he considered that they ought to crush at least 1,500 tons per month. Therefore, if they took the value of the ore at £3 10s. per ton, they would have a return of £5,250 per month. Taking the profit at £1 10s. per ton only, the proceeds to the company would be £2,250 per month, or £27,000 per year. He had every confidence in saying that that would be realised when the wet-crushing was fully at work.

Mr. Cutliffe suggested that instead of splitting up the property the directors should take power to increase the capital to whatever extent they thought necessary. He had no doubt that the shareholders would take up any fresh capital, and by the utilisation of the capital they would be able to increase the returns considerably.

The Chairman said the board would take Mr. Cutliffe's suggestion into consideration. No scheme would be hastily adopted.

The motion was then put and carried unanimously.

Mr. G. Rothwell proposed the re-election of Mr. Carvill as a director, which was seconded by Mr. C. de Pass and carried.

On the motion of Mr. Freeman, seconded by Mr. C. de Pass, Mr. Charles Fox was re-appointed auditor, and the proceedings closed with a vote of thanks to the chairman.

New Zealand Crown Mines Company (Limited), Karangahake.

The first annual general meeting of the New Zealand Crown Mines Company (Limited) was held on the 15th December at the Cannon Street Hotel, London, Sir Westby B. Perceval, K.C.M.G., presiding.

The Chairman, in moving the adoption of the report and accounts to the 31st August last, the confirmation of the dividend of 5 per cent. paid in July last, and the placing of £2,000 to reserve against depreciation, stated that the value of the bullion recovered in the period under review amounted to £58,171, extracted from 18,640 tons, showing a profit of £12,626. The expectations of which the shareholders were informed at the statutory meeting in October, 1896, had been more than realised. At that meeting the board stated the opinion of those most competent to judge that the shareholders possessed a valuable mine, with a strong, rich, and well-defined reef. The chairman proceeded to explain how far the programme of operations foreshadowed at the statutory meeting had been carried out, giving details of the appliances that had been provided for the development of the property. With regard to the stamping-power, it had been the intention to increase the battery from 40 to 80 stamps in order to double the output, but as a result of experiments made by their mine-manager, Mr. Daw, they had discovered that their battery of 40 stamps, crushing by the wet process, would have capacity equal to the 80 dry-stamp battery which they had contemplated erecting, the tonnage crushed being thus doubled without any other expense than the addition of a few vats. They had been gradually converting the dry-stamping into wet-stamping, and consequently showed a large increase in the amount of ore put through the mill during the last four months of the period ending the 31st August. This increase had been further maintained since the close of the year, and they had now almost doubled the former tonnage, and the working-expenses had been proportionally decreased. In view of the abundant supplies of ores which the developments had disclosed, however, the directors had ordered twenty additional heads, and foundations would be prepared for a further twenty. The developments showed that if no serious disturbance occurred in the course of the reef the mine had many years of existence before it.

Mr. John Wilson, M.P., seconded the motion, which was carried unanimously.

New Zealand Talisman Gold-mining Company (Limited), Karangahake.

The ordinary general meeting of the shareholders of this company was held on the 8th December, at Winchester House, London, E.C., Lord Ernest Hamilton presiding.

In moving the adoption of the report and accounts, the Chairman said when they took over the property the reef had been proved in five levels, but they had now proved it in the No. 6, and their manager informed them that another six levels could be driven before reaching the water-level. Therefore they would appreciate the immense body of ore they had to treat. It was estimated that there were at least 8,000 tons of payable material between Nos. 1 and 5 adits. The crushings already made showed that the ore would yield about £3 a ton, half of which would be profit.

Mr. F. T. Ford seconded the motion, and it was carried.

Waihi-Silverton Extended Gold-mining Company (Limited), Waihi.

The third ordinary general meeting of the Waihi–Silverton Extended Gold-mining Company (Limited) was held on the 23rd December, at the Cannon Street Hotel, London, Mr. W. T. Morrison presiding.

The Chairman said,—When I last had the pleasure of meeting you I told you that we had determined to issue some new capital, and we gave the shareholders the offer to take 10,000 shares. They took up those shares practically to the full quantity, and 9,730 were issued. Since that time we have made considerable development. We cut the reef at the new level, No. 2, on the 19th February last. At the time of our cutting that reef the lode at the point of intersection was found to be poor, and only 4 ft. wide. Since then a considerable expansion has taken place on that reef, and it has widened out to 12 ft. or 14 ft., and has increased in value very considerably. The cost of mining was reported to us by the old board and by the old manager at about £1 a ton; but we found on examination that, instead of being £1 per ton, it was more or less £2 5s. per ton, and therefore we have again been disappointed in that direction. The intention of our new manager, Mr. Griffiths, with whom we are entirely satisfied, has been to reduce that output by economies in the working, and he has succeeded in reducing the working cost gradually month by month, as you will see by the tabulated statements in the report, from £2 5s. to £1 7s. Since then it has been still further reduced, and the cost is reported to us by the manager as not much more than £1 1s. or £1 2s. a ton. He expects to cut that down still further, and if he does we believe our working cost will be considerably below that of any other mine in the district. We determined to sink the shaft, as we informed you at the last meeting, a further 100 ft., and the sinking of that shaft was commenced in the middle of June. We commenced cross-cutting from the shaft on the 7th or 8th November last, and rapid progress is being made with that cross-cutting—in fact, we hope to receive a cablegram about the middle of January next to state that the lode has been intersected. We did hope that at this meeting we should be able to report the intersection of the lode at that point, but we are now informed that it cannot be done until about the 15th January. Of course, a great deal will depend upon the strength of the lode at the No. 3 level, and we shall not be able to report for some little time after that intersection, because when we intersected the lode at No. 2 level, 80 ft. above the point where we are now hoping to intersect it, we found that it was poor, but, as I said, has gradually increased in value and width. There is this further interest in the intersection of the lode on the No. 3 shaft, or rather the development at the No. 3 level: that we may possibly intersect the Amaranth and the Rosemont Reefs, which are tending towards us from the neighbouring property belonging to the Union Company. That, of course, will be a matter of very considerable importance, and it is one of the expectations which, if fulfilled, would render this mine extremely valuable. But with regard to the developments at the present moment Mr. Griffiths, the general manager, writing on the 24th September, says, "Although I am hopeful that at the deeper levels, possibly No. 3 level, the ore will be of such a quality, and that we shall meet with the Amaranth and Rosemont Reefs, I think it would be better to continue the mine as a low-grade proposition with ore of a value of, say, £1 10s. per ton, rather than hope for a sudden great increase in the value of the reef. I feel confident that, with an output of 3,000 tons to 3,500 tons per month, with a reef as large as it is at present (about 10 ft. to 12 ft. wide), and an ore-value of £1 10s. per ton, I would make your mine a payable mine." Then, again, he says on the 19th October, "I hope to increase our returns sufficiently to enable me to work the mine and battery and continue the developments without more than a very small monthly remittance from you. In fact, I shall endeavour to pay all expenditure at this end of the mine. You will remember, however, that ultimately repairs to the battery will have to be resumed; but I shall try and leave this till after No. 3 level is reached. The expenditure has been reduced to a minimum in every department, and, as you will see by the costs sheets, our working costs are very low—50 per cent. lower, in fact, than any mine in the neighbourhood.

I am hopeful as to the value of No. 3 level, although it is just possible that at the point at which No. 3 crosscut will intersect the reef the latter will not be of very high grade." Lately, at the request of some influential shareholders, the property was visited by an engineer in the colony, who I believe to be a thoroughly capable man, and he has given us a very interesting report, and has made several suggestions which are very valuable. One extract from his report which is very interesting, and which refers to the possibility of other reefs being found on the property, is as follows: He writes, "When No. 3 is opened out I would recommend exploring for all the known reefs that make into the Silverton ground—namely, the Amaranth, Rosemont, and another making in from the Union Company's ground near the Gladstone. The strike of the Amaranth Reef intersected the Silverton main lode at between 150 ft. and 200 ft. of the cross-cut." He expects a junction with the Silverton reef in depth. As regards the No. 2 reef, he agrees with Mr. Griffiths that our best policy is to wait for the development of the Waihi Consolidated Company, which is down 200 ft. on the Silverton boundary. In view of the facts that there is only one lode prospected or opened up at all, though others apparently traverse the property, that the main lode is a large body and profitable at its present value if treated in large quantities, he thinks we have fair grounds for confidence in the future. That is the gist of the report of the engineer to whom I have referred. Then there is another very interesting matter. Some of our neighbours adopted wet-crushing, and if our ores can be treated in that manner the effect would be to enable our present stamps to nearly double the quantity of ore treated. We shall probably experimentalise with our ore in order to discover whether that method can be adopted in reference to the treatment of our ore. Another very interesting fact which has been brought to my knowledge by one of my colleagues is this: He states that when he was in New Zealand he came in contact with a well-known geologist, who expressed his opinion that the Silverton lode would lead to a great depth, and this bears out what we were told by the late Mr. Spratt when we took possession of this property. The geologist thinks that the lode will live to a great depth; in fact, to as great a depth as it would be practicable to mine, and Mr. Spratt advised us to make our shaft of such dimensions that if necessary we might go down to 2,000 ft. This is consequently corroborative testimony from a practical geologist of the opinion which Mr. Spratt then expressed, and it rather goes to show that we have a permanent mine, although possibly of a low-grade character. With regard to the policy in the future, that is, of course, a matter of considerable importance. As I told you, we raised £10,000, and the greater part of that has been expended during the past year, partly on account of the increase in the plant, partly on account of the sinking of the shaft, and partly on account of the liabilities which have been incurred by your board, and with which we were at this time last year unacquainted. We shall have to consider the question of the energetic development of the mine in the future. The object which we ought to have is to sink the shaft into possibly about 500 ft. or 600 ft.—that is to say, about double the distance to which we have now got. But the driving of the lode at the No. 3 level is a matter of primary importance, and in the course of a month or two we shall be in receipt of complete information on that matter. If the lode at No. 3 level proves as strong as it is now making, it will be absolutely confirmatory evidence of the opinions which the geologist I have mentioned and the late Mr. Spratt formed of our reef. We shall then have to consider the question of further capital. When we issued our last 10,000 shares we gave the shareholders the option of taking a further 10,000 shares within twelve months—that is, to the 3rd March next year. If that option is exercised, we shall be in ample funds to carry out the developments to which I have referred. No doubt the result of the cutting of No. 3 reef will have some influence upon the exercise of that option. We shall have, of course, under any circumstances to consider the steps which it may be necessary to take in order to provide the necessary capital for bringing this mine into thoroughly successful operation—that is to say, if the opinions expressed by the general manager and the engineer who has lately examined the property are borne out. I do not know, gentlemen, that I have anything further to say, except that we have a very extensive area of ground (about 174 acres), and we do not know what possibilities may exist in so large an area; but no doubt we shall eventually prospect to see if we can get other reefs on the property, and, at any rate, our first business seems to me to develop the portions that we have so far developed, and to continue to carry the work on. I shall be very happy to answer any questions that may be put to me, and I beg to move, That the report and accounts be received and adopted.

Mr. O. H. Davis seconded the motion, and, after a short discussion, it was put and carried.

The retiring directors, Mr. W. Lunan and Mr. O. H. Davis, were re-elected, as also were the auditors, Messrs. Ford, Rhodes, and Ford; and the meeting terminated with a vote of thanks to the chairman and directors.

Waihi Grand Junction Company (Limited), Waihi.

An extraordinary general meeting of the shareholders in the Waihi Grand Junction Company (Limited) was held on the 6th December, at Winchester House, London, E.C., for the purpose of considering and, if thought advisable, passing resolutions authorising the voluntary liquidation of the company for reconstruction. Mr. Leonard Welstead, who presided, moved the resolutions, saying that the reconstruction of the company was absolutely necessary to provide funds for the working of the property. Mr. Walker had, since the last meeting, arrived from the mine, and would be prepared to answer any questions that might be submitted to him as to its present condition.

Mr. Broomhead seconded the resolutions.

A long discussion ensued in which several shareholders objected to the reconstruction scheme as unfair to the holders of preference shares. Eventually the resolutions were put and declared carried by the requisite majority.

Afterwards Mr. Walker addressed the shareholders, speaking very highly of the company's property.

Waitekauri United Gold-mining Company (Limited).

The second ordinary general meeting of the shareholders in the above company took place on the 17th December, at the Cannon Street Hotel, London, E.C., Mr. Robert Smith, M.P., presiding.

In moving the adoption of the report and accounts, the Chairman stated that since the statutory meeting of the company a substantial amount of development work had been done, and the indications in the main tunnel which was being driven were of a favourable character. In the latest cable received from the local directors they stated that the country looked exceedingly well, and they believed they were near the reef.

Mr. R. B. Tetley seconded the motion, and it was agreed to.

Ravenscliff Mining Company (Limited), Marlborough.

The ordinary general meeting of the members of the Ravenscliff Mining Company (Limited) was held on the 17th December, at Winchester House, London, E.C., when the Chairman (Mr. R. B. Ottley), in moving the adoption of the report and accounts, stated that the offer they had last year to purchase the property from the company had been withdrawn, in consequence of the demand for New Zealand mines having fallen off. Since then the directors had been engaged in other negotiations, but so far no definite result had been arrived at.

The motion was seconded and agreed to.

[These reports are taken from the *Mining Journal*, with the exception of the United New Zealand Exploration, which is copied from the *Australian Mail*.]

RESULT OF UNIVERSITY SCHOLARSHIPS AND SCHOOLS OF MINES EXAMINATIONS.

Mines Department, Wellington, 27th January, 1898.

THE following table, showing the results of the recent Schools of Mines examinations, and for university scholarships in connection therewith, is published for general information.

A. J. CADMAN,
Minister of Mines.

Result of University Scholarships and Schools of Mines Examinations.

Thames School of Mines.

Name of Student.	Practical Chemistry (Senior).	Practical Chemistry (Junior).	Theoretical Chemistry (Senior).	Theoretical Chemistry (Junior).	Theoretical Chemistry, Elementary.	Practical Assaying (Senior).	Practical Assaying (Junior).	Practical Assaying, Wet (Senior).	Practical Assaying, Wet (Junior).	Mineralogy.	Metallurgy of Gold and Silver.	Mining.	Ventilation and Explosives.	Pumping and Winding.	General and Mining Geology.	Land and Mining Surveying.	Map-drawing.	Mechanical Drawing.
K. M. Barrance ..	100	..	100	..	..	..	..	..	..	..	95	95	90	..	70	95	87	75
W. Donovan	100	..	97	..	..	100	..	80	..	90	94	93	86	81	85	67	80	78
H. E. Metcalfe ..	100	..	85	..	..	90	..	94	..	96	97	95	95	86	85	55	75	75
E. J. Banks	71	..	78	..	..	97	..	96	..	73	93	78	66	80	65	67	85	77
H. Croucher	73	..	67	..	..	86	..	80	..	..	..	..	..	..	*	84	90	..
D. Hughes	..	..	..	..	..	..	..	..	..	..	..	90	80	76	..	..	..	..
W. W. Browne ..	..	65	..	..	..	98	..	..	90	52	..	..	..	..	*	24	60	..
M. D. O'Keefe ..	..	..	..	..	..	..	..	..	..	..	..	85	70	65	..	13	50	..
A. Whitley	..	..	..	..	..	..	..	..	..	..	..	95	..	..	..	..	..	..
W. S. Morrin ..	..	..	..	..	..	86	..	72	..	..	93	..	..	..	..	..	..	..
W. J. Gillies.. ..	..	..	65	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
J. B. Empson ..	..	60	..	51	..	74	..	..	84	..	..	..	..	..	..	..	..	..
J. Causley	..	..	..	..	..	68	..	..	..	..	92	..	..	..	..	..	..	..
G. Heimbrod ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	78	95	..
A. Campbell	..	..	..	..	..	80	..	*	..	..	..	..	..	..	..	..	..	..
L. Gordon	..	..	..	..	..	*	..	*	..	..	..	..	..	..	..	..	..	..
R. McQuade	..	..	..	..	..	56	..	..	..	..	..	..	..	..	..	..	..	..
F. Wells	..	..	..	..	..	50	..	..	..	..	..	..	..	..	..	..	..	..
A. Somerville ..	..	..	..	..	..	*	..	..	..	..	..	..	..	..	..	..	..	..
W. Dare	..	..	..	..	..	60	..	..	..	..	..	..	..	..	..	..	..	..
D. Twohill	..	..	..	..	..	51	..	*	..	..	..	..	..	..	..	..	..	..
F. Jones	..	..	.	..	..	70	..	..	..	..	..	..	..	..	..	..	..	..
G. Foy	..	..	..	..	..	62	..	..	71	..	..	..	..	..	..	..	..	..
F. W. Hetherington ..	..	..	..	..	..	74	..	..	..	..	..	..	..	..	..	..	..	..
L. Thorburn ..	..	..	..	..	..	72	..	..	..	..	..	..	..	..	..	..	..	..
Y. Williams	..	..	..	..	..	*	..	..	..	..	..	..	..	..	..	..	..	..
A. H. Wilson ..	..	..	..	..	..	80	..	..	..	..	..	..	..	..	..	..	..	..
W. Moyle	..	..	..	..	..	50	..	*	..	..	..	..	..	..	..	..	..	..
C. Clark	..	..	..	..	..	85	..	..	..	..	..	..	..	..	..	..	..	..

* No award made.

NOTE.—Messrs. K. M. Barrance, W. Donovan, and H. E. Metcalfe were the only scholarship candidates.

By Authority: JOHN MACKAY, Government Printer, Wellington.

The New Zealand Mines Record.

LIST OF AGENTS.

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"	Upton and Co.
Coromandel	T. W. Rhodes.
Thames	R. Burra.
Paeroa	J. Nathan.
Karangahake	N. White.
Waihi	C. J. Saunders.
Waitekauri	J. Firth.
Te Aroha	Te Aroha News Company.
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Cullensville	D. A. Halket.
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Collingwood	L. Sutton.
Lyell	W. Atkin.
Reefton	E. J. Scantlebury.
Charleston	Gardner and Sutton.
Greymouth	Whitaker Brothers.
Kumara	R. M. Spiers.
Hokitika	J. King.
Christchurch	Simpson and Williams.
"	Whitcombe and Tombs.
"	H. J. Wood and Co.
Dunedin	Wise and Co.
"	A. Sligo.
"	J. Braithwaite.
"	J. Horsburgh.
Lawrence	Mrs. S. E. Harrop.
Alexandra	L. Ryan.
Cromwell	H. Hotop.
Arrowtown	H. B. Smith.
Queenstown	L. Hotop.
St. Bathan's	W. McConnochie.
Naseby	J. Brown.
Baldhill Flat	J. R. Kemp.
Miller's Flat	P. Laffey.
Ophir	B. Flannery.
Hyde	A. Arthur.
Middlemarch	C. D. Smith.
Macrae's Flat	W. Griffin.
Waikaia	W. Nation.
Invercargill	Wesney Brothers.
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EXAMINATION FOR MINE-MANAGERS' AND BATTERY-SUPERINTENDENTS' CERTIFICATES.

Mines Department,
Wellington, 3rd November, 1897.

An Examination of Candidates for Certificates as First- and Second-class Mine-managers and Battery-superintendents, under "The Mining Act, 1891," and Amendment Act, 1894, and First- and Second-class Mine-managers under "The Coal-mines Act, 1891," will be held on Tuesday, the 25th January, 1898, and three following days.

T. H. HAMER,
Secretary to the Board of Examiners.

THE NEW ZEALAND MINES RECORD.

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